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# THE COMMENTARIES UPON THE APHORISMS OF Dr HERMAN BOERHAAVE,

The late Learned Profeſſor of Phyſic in the
Univerſity of LEYDEN,

CONCERNING

The KNOWLEDGE and CURE of the ſeveral
DISEASES incident to HUMAN BODIES.

By GERARD VAN SWIETEN, M. D.

Tranſlated into ENGLISH.

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# CONTENTS.

OF Fevers in general, — — Page 1

The Cold-Chill in Fevers, — — 404

The Tremors or Shakings in Fevers, 420

Anguiſh or Oppreſſion in Fevers, 440

# COMMENTARIES
UPON THE
# APHORISMS
OF
HERMAN BOERHAAVE,
CONCERNING THE
KNOWLEDGE and Cure of DISEASES.

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## Of Internal DISEASES, and of FEVERS in general.

### SECT. DLVIII.

WE are now to explain the nature of a fever, which is the moſt frequent of all diſeaſes, an inſeparable companion of inflammation, often the cauſe of numerous other diſorders, and of death itſelf, though frequently it happily proves the cauſe of a recovery.

We have, in the preceding volumes, explained the moſt ſimple diſeaſes of the ſolid parts, as alſo the diſorders which happen from a ſpontaneous degeneration in the humours; we likewiſe compleated the hiſtory of external or chirurgical diſorders, whoſe cauſes and principal effects lie open to the ſenſes: We are now, therefore, to treat of internal diſeaſes, whoſe cauſes are more concealed and difficult to be known, inaſmuch as they frequently bury, or hide themſelves from the ſenſe, in the moſt internal or central parts of the human body; and we are, likewiſe, to diſcover the cauſes and effects of theſe internal diſeaſes, leſs obvious to the ſenſes, which we can hardly do, but by an obſervation of the injured functions, and by a compariſon of them with the like diſorders happening in the external parts of the body.

Indeed, the great number and variety of theſe diſeaſes occaſions no ſmall difficulty in determining with which diſeaſe one ought to begin, in laying down the hiſtory of thoſe, which are internal; but if to theſe internal diſeaſes we apply the rules, which were before enumerated at § 16, the reaſon will be evident, why we are to treat firſt of fevers. For a more evident knowledge of the diſeaſe, a greater ſimplicity in its nature, and its eaſily admitting of a cure, are circumſtances neceſſary or required in that diſeaſe; the hiſtory of which ought to precede the reſt, to advance our doctrine in a methodical or juſt order: But, in the mean time, it muſt be confeſſed, that the nature of fevers is more than a little concealed from us, and that they frequently put on very different faces, nor are they always eaſily to be cured; but then all theſe difficulties equally attend upon the other internal diſeaſes. But the fourth rule, which was preſcribed at § 16, agrees more with fevers than all the reſt of internal diſeaſes; namely, inaſmuch as a knowledge of theſe is neceſſary towards underſtanding the reſt of diſeaſes: For, a fever, as we ſhall ſoon make it appear, is the moſt frequent of all diſeaſes, and is always a companion with every inflammatory diſorder, and very frequently attends the other diſeaſes which are not inflammatory; whence it is evident that the hiſtory of fevers ought to precede the hiſtory of other internal diſeaſes.

The term Fever is derived from the Latin *fervor* heat, according to the opinion of moſt phyſicians; but others derive it (*à februando*) from a purification or cleanſing. The firſt derivation is more agreeable to the opinion of the antient phyſicians, who have pronounced heat to be the eſſence of a fever; for ϖυρετὸς and ϖυρὲξις, which ſignify a fiery heat, are words alſo commonly uſed by the antient phyſicians to denote a fever; and even Galen [a] obſerves, that a fever, when very violent, is by Hippocrates called (ϖυρ) fire. But the latter derivation is more agreeable to many, becauſe by a fever the body is frequently depurated.

The moſt frequent of diſeaſes.] It will be demonſtrated hereafter at § 586, that fevers ariſe from cauſes extremely numerous, and very different from each other; and it will be there likewiſe evident, that no human prudence can ſo avoid all the cauſes, as to enable a perſon to remain free from a fever all his life-time. The defects of diet, and the viciſſitudes of air or weather, and, eſpecially, when there is a ſudden alteration in the air from heat to cold, *&c.* with the more than uſually violent exerciſes of the body, ſtrong paſſions of the mind, *&c.* frequently excite fevers, even in the moſt healthy bodies. While the philoſopher, being content with a little, leads a frugal life, and has, after many ſtruggles, learnt to govern his paſſions, he, indeed, avoids a great number of the cauſes of fevers; but yet, being frequently employed on books, and exhauſted by continual meditations, he too late repents the having brought upon himſelf the cauſes, not only of fevers, but likewiſe of many more of the moſt obſtinate diſeaſes. Hence, we may almoſt venture to affirm, that

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[a] Comment. 13. in 1. Epidem. Charter. Tom. IX. pag. 102.

that no perſon can live without a fever, and that few die without it. For, if we except thoſe, who periſh by a violent death, and ſuch as are ſo fortunate, as to be extinguiſhed by mere old age without diſeaſe, which are indeed few, almoſt all the reſt die, either of a fever, or of diſeaſes which are accompanied with a fever. We read, in Pliny[b], with what fear and trembling the Romans endeavoured to have this univerſal diſeaſe, a fever, appeaſed by their ſupplications in the Temple of Fanum. And hence, perhaps, it is that fevers are called diſeaſes by Heſiod[c], and that Horace[d] calls all diſeaſes ſimply fevers, when they tumbled out of the box of Pandora.

*Poſt ignem ætherea domo*
*Subductum, Macies, & nova Febrium*
*Terris incubuit cohors.*

An inſeparable companion of inflammation.] That a fever always attends in the moſt violent and inflammatory diſeaſes, there is no one doubts. Thus it will appear hereafter, in the hiſtory of a pleuriſy, that this inflammatory diſorder is rarely obſerved without a fever preceding, but never without a fever attending. But when a ſlight inflammation only is ſeated in ſome external part of the body, one may then, with more reaſon, doubt, whether it is always accompanied with a fever. But if you peruſe what has been ſaid of inflammation in § 371, it will be ſufficiently apparent, that a fever is deſervedly pronounced an inſeparable companion of inflammation, and that it is even a fever, which diſtinguiſheth inflammation from obſtruction. This was alſo the opinion of Hippocrates[e], who, endeavouring to demonſtrate that the air is able to do much in producing all diſeaſes, ſays; *Primum autem à communiſſimo morbo febre incipiam, ille enim morbus inſidet* (ἐφεδρεύει) *omnibus aliis morbis præſertim verò inflammationi*; "But I "ſhall begin firſt with the moſt common diſeaſe, "a fever, for that accompanies all other diſeaſes, "but more eſpecially inflammation."

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[b] C. Plin. Secund. Hiſt. Nat. Lib. II. cap. 7. [c] Opera & Dies verſu 102. [d] Lib. I. od. 3. [e] De Flatibus cap. 3. Charter. Tom. VI. p. 215.

Numerous diſeaſes and death, *&c.*] Since in every fever the velocity of the motion of the circulating humours is increaſed, it is evident that all the diſorders, which are obſerved to follow from that increaſed velocity, may reſult from a fever as the cauſe. But how bad, and how numerous theſe effects frequently are, has been made evident, in what was ſaid by way of comment to § 100. But the truth of this will be ſtill more evident, when we come to treat of the effects of a fever at § 587. For moſt of the acute diſeaſes ariſe after a fever preceding, as will be made evident in the hiſtory of them: And again, all thoſe acute diſeaſes are more or leſs accompanied with a fever. But even chronical diſeaſes owe their riſe, in a great meaſure, to the diſorders which have been left by acute diſeaſes, not well cured, as we ſhall declare hereafter, at § 1050. Hence it will not ſeem wonderful, that fevers ſhould be the cauſes of moſt diſeaſes, and of death: But it may, perhaps, not appear ſo evidently to ſome, that a fever, itſelf a diſeaſe, ſhould, nevertheleſs, frequently prove one of the beſt cauſes in curing diſeaſes: And yet nothing is more true than this aſſertion, which is confirmed by moſt certain obſervations in all ages; from a great number of which obſervations it may be ſufficient for us to relate a few. Hippocrates[f] tells us, that an apoplexy may be cured, if the patient is ſeized with a fever; although he had before pronounced a profound apoplexy incurable, and a ſlight one very difficult to remove[g]: And, in another place he ſays: *Si quis ebrius de repente obmuteſcat, convulſus moritur, niſi eum febris corripuerit, aut quâ hora crapula ſolvitur, vocem edat;* "If "a drunken perſon ſuddenly loſes his ſpeech, he "dies convulſed, unleſs he ſhould be taken with "a fever, or recover his ſpeech as ſoon as his "drunken fit is over." Hippocrates alſo[h] acquaints us in ſeveral places, that convulſions, and even a tetanus, are often cured by a fever; *à convulſione ſi febris prehenderit, ceſſat eodem die, aut poſtero, aut etiam tertio*[i] *mulieri, ex partu convulſione infeſtatæ, febrim ſupervenire bonum. Tetano & convulſioni febrim ſupervenire bonum*[k]. "If the "patient ſhall be ſeized with a fever after convul- "ſions, they ceaſe the ſame day, the day after, or "at leaſt on the third day: If a woman is taken "with a fever, after being ſeized with convulſions "from being delivered, it is a good ſign. For a "fever to come after a tetanus and convulſions is "a good ſign." Hippocrates, likewiſe, in many places acquaints us, that a quartan ague is of very long continuance, but without danger, and a preventative to many other greater diſeaſes. [l] There are alſo many ſalutary effects of fevers recorded by Hippocrates in other diſeaſes, a great part of which has been collected by Celſus, where he treats of thoſe ſigns, which denote danger or recovery in any diſeaſe[m], as follows. *Denique ipſa febris, quod maxime mirum videri poteſt, ſæpe præſidio eſt. Nam & præcordiorum dolores, ſi ſine inflammatione ſunt,*

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[f] Aphor. 42. Sect. 2. Charter. Tom. IX. pag. 81.

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[g] De morbis Lib. I. cap. 7. Charter. Tom. VII. pag. 558.
[h] Aphor. 5. §. 5. Charter. Tom. IX. pag. 196. & De morbis Lib. I. cap. 7. Charter. Tom. VII. pag. 559. [i] De locis in homine cap. 13. Charter. Tom. VII. pag. 372.
[k] De morbis Lib. I. cap. 4. Charter. Tom. VII. pag. 535.
[l] Epidem. Lib. I. Charter. Tom. IX. pag. 88. & Epidem. Lib. VI. ibid. pag. 550. Aphor. 70. § 5. ibid. pag. 247.
[m] Lib. II. cap. 8. pag. 70.

*ſunt, finit*; *&* *in jecinoris dolore ſuccurrit*; *&* *nervorum diſtentionem, rigoremque, ſi poſtea cæpit, ex toto tollit*; *&* *ex difficultate urinæ morbum tenuioris inteſtini ortum, ſi urinam per calorem movet, levat*, &c. "Laſtly, a fever itſelf (which may indeed "ſeem very wonderful) is often a remedy; for it "removes pains about the præcordia, if they are "without inflammation; it likewiſe relieves the "pain about the liver; and if convulſions or ſhi-"verings afterwards invade the patient, the fever "removes them entirely; and a diſorder of the "ſmaller inteſtines, ariſing from a ſuppreſſion of "urine, is likewiſe relieved by a fever, if the uri-"nary diſcharge is excited by the heat."

A fever is, therefore, not always of pernicious conſequence; and thoſe are in an error, who believe that a fever is always to be reduced, or ſuppreſſed, by all the aſſiſtances of art; whereas nature frequently overcomes ſuch diſeaſes by a fever, as would otherwiſe remain inflexible to the beſt remedies. Sydenham[n], therefore, who was a very happy obſerver of the footſteps of nature, in curing diſeaſes, juſtly calls the fever an inſtrument of nature, by which ſhe endeavours to ſeparate and throw off the impure from the pure parts: And, in another place[o], he ſays, that the fever is excited by nature to diſcharge the foreign matter, which is injurious to herſelf, or elſe to change the blood into ſome new ſtate. An example of the firſt effect of a fever he takes from that kind accompanied with eruptions, as happens in the ſmall-pox and meaſles, *&c.* But the latter he demonſtrates from people being taken with a fever, after they have undergone ſome great alteration in the uſe of the non-naturals, by which fever they are again enabled to ſuſtain what they could not well

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[n] Sect. 1. cap. 4. pag. 72.

[o] In initio ejuſdem capitis pag. 58.

well before ſupport, without manifeſt detriment to their health. For we are taught, by repeated obſervations, that thoſe who take long journeys into the moſt remote regions or foreign climates, after living there ſome time, are generally taken with a fever, though they were before in perfect health; and, by this fever, their bodies receive ſuch an alteration, as enables them more eaſily to ſuſtain the unuſual air and diet of the place for the future.

Sydenham[p] was, therefore, not ſolicitous to remove the fever, but only to obſerve carefully, whether the motion, excited by the fever, was ſo great, as to be uſually followed with dangerous ſymptoms; or if, on the contrary, the motion was ſo languid, as to be unable to procure a ſeparation of the morbid from the healthy parts of the humours, or to attenuate and alter the humours into a new ſtate. But by this knowledge he quieted the ſalutary febrile motion, when it was too exorbitant, and increaſed it, when too languid: But, when the fever continued within its due bounds, he remained only a ſpectator, without making any alteration, ſupporting the patient's ſtrength by a ſuitable regimen or diet, and waiting for the event, which, by the experience in his profeſſion, he knew would be ſalutary. From hence it is, therefore, evident, that a fever ought ſometimes, not only to be left to itſelf in the cure of diſeaſes, but that ſometimes alſo the fever is to be increaſed, agreeable to the rules of art. There is a very ſeaſonable paſſage, in confirmation of this matter, given us by Hippocrates[q], in his Coan prognoſticks, *convulſionem ſolvit febris acuta ſuperveniens, quæ prius non fuit, ſi vero fuit prius jam exacerbata;* "That an acute fever, "coming after convulſions, and not appearing be-"fore, terminates the diſorder; but if the fever

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[p] In initio ejuſdem capitis, pag. 61.

[q] Nº. 358. Charter, Tom. VIII. pag. 871.

“ was previous to the convulſions, the latter is then
“ increaſed.”

## SECT. DLIX.

THE nature of which diſorder, being eſteemed latent or concealed from us, we ought therefore, by all means, to be careful to avoid all error in ſearching out its nature.

It has been thought ſo difficult to know the nature of a fever, that it is almoſt become a proverb, that the wiſeſt man nevertheleſs knows not the nature of a fever: For, if even the moſt ſkilful phyſician ſees a perſon, who has had one or two fits of a regular quartan, but viſits him in the interval betwixt the two fits, or even but half a quarter of an hour before the approach of a new fit, the phyſician will then diſcover no defect, either in the ſolid or fluid parts of the body, and often he will not be able to perceive any injury in the functions, though, in a few minutes after, the patient will be invaded with his fever. The greateſt caution is, therefore, neceſſary in ſearching out the very latent nature of a fever. In this caſe we are not to aſſume any thing from hypotheſes, previouſly contrived, however ingenious they may ſeem; but we are only to conſider the appearances of the fever preſent in the body, and to weigh each of them apart, that, by afterwards comparing them together, we may, by juſt reaſoning, be led from them to underſtand the proximate cauſe of a fever. While the moſt acute philoſophers indulge their ſpeculations, in ſearching after the cauſes of natural things, they often entertain us with ſplendid theories and wonderful products merely of imagination, yet without doing any great damage: But when this way is taken to diſcover the nature of diſeaſes, the method of curing may be founded upon a falſe hypotheſis, which would be turning into a paſtime a matter of the greateſt importance, and moſt ſerious conſideration; namely, what relates to the life and health of ourſelves, and the reſt of mankind.

## S E C T. DLX.

BUT in this caſe the great number of ſymptoms, with which a fever is uſually attended, though it may likewiſe be without them, gives occaſion for the phyſician to fall more eaſily into error or miſtake.

If we look into what is ſaid in the hiſtory of the ſymptoms of fevers, it will be evident, that there is no function in the body, but what has been ſometimes obſerved to be injured during a fever. How often is the patient delirious in a fever, and yet have I ſometimes known the wit to be ſharper in each fit of an intermitting fever: Sometimes the fever is accompanied with a vomiting, nauſea, loſs of appetite, gripes, a diarrhœa, *&c.* and yet, on the contrary, at another time of the fever, there ſhall be an extreme hunger. Sometimes there are pains in various parts of the body, accompanied with a fever, and ſometimes on the contrary, the pains are obſerved to ceaſe, during the time of the fever, and return again, when the fever ends. This great number and variety of ſymptoms has led many into error, according as they have endeavoured to detect the nature of the fever, from only ſome of thoſe ſymptoms, as they more or leſs favoured a preconceived hypotheſis. But as the

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majority of theſe ſymptoms vary almoſt in every febrile patient, as well as in the different ſpecies of the fevers themſelves, it is ſufficiently evident, that the nature of a fever cannot be diſcovered and known from thoſe ſymptoms, which may be ſeparated from the fever: And yet, from theſe have been derived a great diverſity of opinions, concerning the cauſe and nature of fevers, and which have been often ſurprizingly ſet forth, even by phyſicians of the greateſt eminence, to ſupport and defend the opinion which they have once embraced. Both the patient and by-ſtanders might juſtly laugh at a phyſician, who ſhould deny that the patient has any fever, in the beginning of a fit of a quartan ague, where there is often a ſhivering for ſome hours: And yet Fernelius[r] could not be brought to acknowledge, that the rigor or ſhivering, which happens in the beginning of an intermitting fever, ſhould be reckoned a fever, ſince it was not conformable to the opinion of Galen, which he eſpouſed; namely, that a fever was a præternatural heat, diffuſed from the heart throughout the body. Theſe ſeparable or accidental ſymptoms may, therefore, ſerve to diſtinguiſh the ſeveral different kinds of fevers; but we can only make uſe of thoſe ſymptoms for diſcovering the individual nature of a fever, which always accompany every fever.

## SECT. DLXI.

TO avoid ſuch error or miſtake, therefore, it will be neceſſary for us to ſelect only ſuch ſymptoms or appearances (from that infinite variety § 560) as always attend every fever; and, by diſcovering the preſence of which ſymptoms, all phyſicians are taught, that a fever is preſent, and, by the abſence of which, they all judge a perſon to be free from a fever.

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[r] Pathol. Lib. IV. cap. 1. pag. 3.

How much ſoever phyſicians may differ among themſelves about the cauſes and nature of fevers, yet all of them, who are ſkilled in diſeaſes, are capable of diſtinguiſhing, whether a ſick perſon has a fever or not. There are, therefore, ſome ſymptoms or appearances preſent in every fever, by which they are aſſured of its exiſtence; and theſe will be preſent, as well in continual fevers as intermittents, as well in a ſalutary ephemera as in the moſt ardent fever: And theſe ſymptoms muſt alſo attend throughout the whole time of the fever, or elſe they may be fallacious. All the other ſymptoms, therefore, which attend only in ſome fevers, or only at certain times in fevers, are to be rejected, and thoſe only retained, which occur at all times, and in every fever. By this means, we ſhall avoid the confuſion ariſing from ſuch a multiplicity of the febrile ſymptoms; and thus the whole matter of enquiry may be reduced to the greateſt ſimplicity, as will ſoon be evident, from what follows.

## SECT. DLXII.

AND then from theſe ſymptoms (§ 561.) diſcovered, and rightly conſidered, we muſt thence ſearch out the individual nature of a fever.

The celebrated author of theſe aphoriſms is uſed to tell his audience, upon this occaſion, that, by a tedious labour, he collected together, from a great number of authors, thoſe ſymptoms which he had obſerved in fevers. He then blotted out from this catalogue all thoſe which appeared not in all, but only in certain particular fevers, retaining ſuch only which, by the common conſent of authors, and his own particular obſervation, he found to be preſent in every fever; and then, from carefully conſidering theſe inſeparable ſymptoms, and comparing them together, he endeavoured to diſcover the individual nature of a fever. But he was ſurprized to find, that this plain method reduced the matter of enquiry to ſo great a ſimplicity, which, at firſt, ſeemed to be ſo operoſe and difficult to be known; for out of the very numerous catalogue of febrile ſymptoms there remained only the few which next follow.

## SECT. DLXIII.

IN every fever, ariſing from internal cauſes, there is always a ſhivering, a quick pulſe and heat, varying in degree at different times of the fever.

There are then only three ſymptoms or appearances, obſerved in common to all fevers, namely, a ſhivering, quick pulſe and heat. The term horripilatio or ſhivering is uſed by phyſicians to ſignify that ſhaking of the whole body, which ariſes from a ſenſe of cold; as when a perſon being warm ſuddenly expoſes his body to a cold air; the Dutch people call it *Een huyvering*. This ſenſe of cold is always obſerved to attend in every fever, which ariſes from internal cauſes. But, by an internal cauſe, we underſtand that producing the fever, which pre-exiſted in the body before the fever appeared, whether that cauſe was originally at firſt without the body, and entered into it, or whether it was generated within the body itſelf. Thus, for example, the peſtilential contagion, or that of the ſmall-pox, *&c.* being taken into the body, excites a fever, but always with this ſhivering preceding, altho' the cauſe itſelf is not generated in the body, but conveyed into it from without. Thus alſo the bile, being corrupted by ſtagnation or any other cauſe, kindles a fever, which always begins likewiſe with ſuch a ſhivering. But in both theſe caſes, the fever is ſaid to ariſe from an internal cauſe. But when a fever ariſes from an external cauſe, that is, from one which did not pre-exiſt in the body before the fever appeared, then this ſhivering is not always preſent; as for example, if a perſon falls into a fever, after being heated with ſudden and ſevere anger, there is then no ſhivering perceived, but only a heat. The ſame is alſo true, when a moſt acute, and often ſuddenly fatal fever is excited, after moſt violent and long continued exerciſe of body; for then alſo there is no ſenſe of coldneſs perceived; and, therefore, the reaſon is evident, why it is ſaid in the text, that theſe three ſymptoms or appearances are preſent in every fever, ariſing from internal cauſes.

But the quickneſs of the pulſe is meaſured by the exceſs of its celerity, beyond what it uſually beat in the ſame perſon in health. For in different people there is a notable difference obſerved, in this reſpect, and the pulſe of infants is generally obſerved *(cæteris paribus)* quicker than in adults. In an adult, healthy perſon, at reſt, we generally number three pulſes, in the ſpace of two ſeconds of a minute, of which ſpaces there are 3600 contained in an hour: When, therefore, the artery beats oftener in this ſpace of time, the pulſe is ſaid to be quicker. But the febrile heat is likewiſe meaſured by compariſon with the heat of a perſon in health; and this, either by the touch, or by the thermometer, which laſt diſcovers it with much more exactneſs.

But the three forementioned appearances are not obſerved together, throughout the whole courſe of a fever; for the ſhivering attends, when the fever begins, and is then followed by a heat, gradually increaſing, and always the moſt intenſe *(cæteris paribus)* in the height of the fever, decreaſing again afterwards by degrees with the fever itſelf. But ſometimes, tho' rarely, this ſhivering, or chillineſs, accompanies the fever throughout its whole courſe, or elſe the greateſt part of it. Galen[s], ſpeaking of the *febris epiala*, ſays, it is properly thus called, when the patient perceives a fever and chillineſs together at the ſame time, in any part of the body; but, we muſt obſerve, that Galen underſtood the eſſence of a fever to be heat. The ſame, likewiſe, ſeems to have taken place in thoſe fevers, which are, by Hippocrates[t], called Φρικώδεες ϖυρετοὶ horrid. For Galen[u] obſerves, in his commentaries upon this place, that Hippocrates does not ſo call thoſe fevers, in which there is a ſhivering obſerved in the beginning, but ſuch as have the ſhivering extended through the greateſt part of the whole fever; and he adds, that fevers are then ſaid to be horrid, when the ſhiverings are diſtinguiſhed from each other only by ſhort intervals, or fits of intermiſſion. But if the horrors return at large intervals, it is termed *anadiploſis*, or a reduplication, as is moſtly obſerved in ſemitertians, where a new paroxiſm comes on before the firſt fit is quite finiſhed.

But the three forementioned appearances or ſymptoms differ in degree, according to the nature of the fever itſelf, with the different age, habit of the patient, &c. Thus a quartan frequently oppreſſes an old man, in the midſt of winter, with ſo ſevere a cold in the beginning of the fit, that his whole body feels chilled like marble; and, on the contrary, if a tertian invades a ſtrong young man in the ſpring, a ſlight cold or chillineſs is uſually followed with a very intenſe heat. In an *ephemera*, or ſimple fever of a day's continuance, there is a moderate heat; but in an ardent fever, an intolerable burning heat ſoon deſtroys the body; and in ſuch a bad kind of fever, the extremities are often cold, while the patient perceives a burning within his body. We come now, therefore, to the general diviſion of fevers, into acute and ſlow.

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[s] De Febribus Lib. II. cap. 6. Charter. Tom. VII. pag. 132.

[t] Epidem. I. tex. 24. Charter. Tom. IX. pag. 25.

[u] Ibidem.

## SECT. DLXIV.

THE fever, in which the three forementioned ſymptoms, or appearances, (§ 563) run on ſwiftly and with danger, is termed acute.

To denominate a fever acute, it is not ſufficient only for the three forementioned ſymptoms, common in all fevers, to advance ſwiftly, but it is alſo required for life itſelf to be in danger, or at leaſt there ſhould be reaſon to fear it from ſuch a fever: For no one will call a fever of one day acute, when it terminates in twenty-four hours time. For, as Celſus well obſerves, " ſuch a kind of diſeaſe can " be neither termed acute, as it is not dangerous, " nor long, becauſe by proper treatment it is ea- " ſily cured [w]." *Neque acutum diei poteſt, quia non perimit; neque utique longum, quia, ſi occurritur facile ſanatur.* Thus we may very well exclude ſuch ſhort and little or nothing dangerous diſeaſes, from the general definition of acute fevers, which Celſus had a little before given in the ſame chapter, "namely, that they are ſhort and ſevere, ſoon "killing the patient, or ſoon terminating them-"ſelves;" and in the next chapter he adds, "that when the diſeaſe urges with acute pains, "and without intermiſſions of the fits, it is acute." *Breves acutique ſint, qui ſito vel tollunt hominem, vel ipſi cito finiuntur* [x] *ubi ſine intermiſſionibus acceſſiones, & dolores graves urgent, acutus morbus eſt.*

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[w] Lib. III. cap. 1. pag. 111.

But it may be deſervedly queſtioned, what are the limits of time, which the continuance of a fever ought not to exceed, in order to denominate it acute? Galen, and moſt authors after him, propoſe the twentieth day as the fartheſt limits of acute diſeaſes; and as the majority of fevers terminate much ſooner, he has, for the ſake of method, made a farther ſub-diviſion of acute diſeaſes, terming thoſe peracute, which extend to the ſeventh day; yet he terms thoſe exactly peracute which extend to the fourth day, and thoſe not exactly peracute, which are continued to the ſeventh day: But when the diſeaſe exceeded the ſeventh day, and terminated within the twentieth, he calls it ſimply acute. And, again, thoſe he makes exactly acute, which extended to the fourteenth day; but ſuch as continued to the twentieth day, not exactly acute. Almoſt the like diſtinctions are made by Hippocrates [y] in his Prognoſtics.

But as every fever terminates in health, another diſeaſe, or in death, as we ſhall declare at § 591; if then the fever exceeds the ſpace of twenty days without terminating in health or death, and without changing into any other diſeaſe, but runs on

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[x] Cap. II. p. 113.

[y] De diebus decretoriis Lib. II. cap. 12. Charter. Tom. VIII. pag. 489.

on in the ſame manner, and almoſt with the ſame ſymptoms, it would ſeem hard to call ſuch a fever on the twenty-ſecond day, long or ſlow, which, two or three days before, was reckoned among the acute, and ſtill continues the very ſame diſeaſe, only running to a greater extent. In ſuch a caſe, the antients have called them indeed acute fevers, not ſimply ſo (ἐκ μεταπτώσεως ὀξέα [z]) but extended. For [a] Galen had known many who had been afflicted with an acute continual fever, even to the fortieth day, who all that time never recovered their health; whence, he ſays, it is evident that ſuch diſeaſes cannot be termed ſlow or chronical; and yet they cannot be termed ſimply acute, agreeable to the received doctrine; and therefore ſuch diſeaſes are diſtinguiſhed by him with the name afore-mentioned, that they might not be confuſed with acute diſeaſes, properly ſo called. But when the fever terminated within that ſpace of time, ſo as to be perfectly off and return again, then it was enumerated among diſeaſes of long continuance. For it frequently happens, and ſeveral ſuch caſes are related by Hippocrates in his Epidemics, in which, when the diſeaſe has ſeemed to be terminated, it has, nevertheleſs, returned again; and ſuch returns generally began upon ſome critical day, of which we ſhall ſpeak hereafter, and again terminated on ſome other critical day. But ſince the intermediate days betwixt the imperfect removal of the diſeaſe, and its return again, were without any fever, therefore ſuch diſeaſes cannot be called acute and extended; therefore Galen [b] would have all theſe particular diſeaſes or attacks termed acute; but the whole aſſemblage of them together he would have termed a diſeaſe of long continuance.

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[z] Charter. Tom. VIII. p. 664.

[a] Galenus de diebus decretoriis Lib. II. cap. 12. Charter. Tom. VIII. p. 490.

[b] Lib. II. de diebus decretoriis cap. 4. pag. 482, 483.

Perhaps, ſome may believe, that in the beginning of ſuch diſeaſes, there are certain ſigns to be diſcerned, from whence one may conclude whether they will terminate in the ſpace of twenty days, or ſooner, or whether they will run out beyond that time; and that therefore at the beginning one might determine whether the diſeaſe ought to be ranked among the acute, or thoſe of long continuance. But Hippocrates has obſerved to us [c], *per horum initia difficilius eſſe eos prænoſcere, qui intra longiſſimum tempus judicari debeant, ſimilia namque ſunt illorum principia. Verum à primo die animadvertendum eſt, & ad quemque quaternarium additum conſiderandum, nec latebit, quo ſe verſurus ſit moribus.* "That in the beginning of theſe diſ-" eaſes, it is more difficult to know which of "them will terminate in the longeſt time, becauſe "the appearances of them are alike. But that "one's obſervation ought to be begun from the "firſt day, and an enquiry made upon every "fourth day from, or added to the firſt, whence "it will not be concealed from the phyſician how "long the diſeaſe is about to extend itſelf." Hippocrates alſo ſeems, in his Prognoſtics, to extend the limits of acute diſeaſes to the ſpace of ſixty days, which he alſo remarks in another place, where he ſays, [d] *Judicantur autem febres quarto die, ſeptimo, undecimo, decimo quarto, decimo ſeptimo, uno & vigeſimo. Ex his vero acutis trigeſimo, dein quadrageſimo, poſtea ſexageſimo. Quum vero hos numeros exceſſerint, diuturna jam evadit febrium conſtitutio*; "But fevers are terminated on the fourth, "ſeventh, eleventh, fourteenth, ſeventeenth, and

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[c] In Prognoſticis Charter, Tom. VIII. pag. 665

[d] In fine libri de diebus criticis. Charter. Tom. VIII. pag. 376.

"twenty-firſt day. But out of theſe the acute "terminate on the thirtieth, others on the fortieth, and others again on the ſixtieth; but when "fevers have exceeded thoſe numbers, the conſtitution of them becomes ſlow, or of long conti"nuance."

But all theſe particulars ought to be underſtood only of thoſe fevers which continue the ſame diſpoſition, notwithſtanding they are extended to ſuch a length. For acute diſeaſes, after having run through their courſe, frequently terminate neither in health nor death, but in ſome other diſeaſe, which diſeaſe, though reſulting from an acute one, is, nevertheleſs, juſtly termed long. Thus an empyema and phthiſis ſometimes ariſe from a pleuriſy coming to ſuppuration, and which are dangerous caſes, though they do not terminate ſpeedily, but kill by a ſlow death, or elſe are cured, but with difficulty, and after a long time. But in what manner fevers often terminate in other diſeaſes, we ſhall explain hereafter at § 593.

## SECT. DLXV.

BUT when thoſe inſeparable ſymptoms of a fever advance ſlowly, with or without danger, the fever is ſaid to be ſlow.

From what has been ſaid in the comment to the preceding aphoriſm, it is ſufficiently apparent what fevers ought to be termed ſlow, namely, ſuch as do not exceed the ſpace of time there limited; but, to denominate a fever acute, it is required that its ſwift courſe be joined with danger; but, in order to denominate a fever ſlow, the ſmall advance which it makes is ſufficient, whether life be in danger

ger or not. For a quartan hardly ever proves fatal, unleſs by ſome error in the patient or phyſician, and ought therefore to be ranked among diſeaſes of a long continuance, as well as a hectic fever, from whence very few eſcape. Therefore Celſus very well defines diſeaſes of long continuance to be thoſe, [e] *Sub quibus neque ſanitas in propinquo, neque exitium eſt*; "In which neither health nor death are near at hand."

## SECT. DLXVI.

BUT both acute and ſlow fevers (§ 564, 565.) are either epidemical in common to a whole people, or elſe peculiar to this or that perſon.

We come now to another diviſion of fevers, to which both acute and ſlow ones are equally ſubject, namely, that all fevers are either epidemical, invading a great many people in the ſame country or place, though of different temperatures, and various in their way of living; or elſe they are peculiar to this or that individual perſon, and are called ſporadic. The origin of epidemic fevers, is always from ſome cauſe in common to the whole people who inhabit any particular place; as for example, when in beſieged cities the ſcantineſs of the market obliges all to uſe an ill courſe of diet, or when the cauſe which popularly ſpreads the fever lies concealed, of both which we have had many inſtances. But ſporadic, or particular fevers differ with reſpect to their original cauſes, almoſt in every individual perſon, according to the particular habit, way of life, or preceding diſeaſes. Since epidemical

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[e] Lib. III. cap. 1. pag. 111.

cal fevers ariſe from ſome common cauſe, they have uſually almoſt the ſame courſe and ſymptoms, and require the ſame method of cure in all: but particular fevers, ariſing from very different, and often oppoſite cauſes, require to be treated in a different manner in various people. But this diviſion of fevers was made long ago by Hippocrates, who ſays, [f] *Febrium autem duo ſunt genera, unum quidem omnibus commune, peſtis* λοιμος *appellatur, alterum vero ob pravam diætam privatam prava diæta utentibus contingens*; "But there are two kinds of "fevers, one common to all people, called the "plague, but the other, ariſing from a bad diet, "happens peculiarly to thoſe who make uſe of ſuch "a diet" But it is ſufficiently evident from what follows in the ſame chapter, that by the word λοιμος Hippocrates did not underſtand the plague, properly ſo called, but only a fever common to many people living together in the ſame place.

But we much more frequently meet with acute fevers epidemical; and ſlow fevers more rarely, among which laſt quartans are the chief. But it alſo appears from the obſervations of Hippocrates[g], that certain diſpoſitions of the air favour the riſe of chronical diſeaſes; for he remarks, that after a year has been attended with a mild and moiſt ſoutherly wind, many have become tabid or conſumptive; and in another place [h], he ſays, that at ſuch times a great many of thoſe who have lain a great while under an imperfect waſting, have been laid up with a perfect tabes. Alſo in many who doubted whether they were conſumptive, the tabes has been confirmed; and thoſe who have been naturally inclined to this diſeaſe, have, after ſuch a ſeaſon, been firſt invaded with a conſumption. He likewiſe adds, that then ſuch as were taken with a conſumption, periſhed ſooner than they uſually do in that diſeaſe.

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[f] De Flatibus cap. 3. Charter. Tom. VI. pag. 215. [g] Epidem. 3. Charter. Tom. IX. pag. 263. [h] Epidem. 1. Charter. Tom. IX. pag. 22--25.

## S E C T. DLXVII.

THOSE are called acute febrile diſorders, which are accompanied with the fever before mentioned (§ 564.) as thoſe are called chronical, febrile caſes, which are attended with that kind of fever at § 565.

Since all inflammatory diſeaſes, and many others, are accompanied with a fever, as was ſaid before, at § 558, therefore the hiſtory of fevers, taken in its greateſt latitude, would include the greateſt part of diſeaſes, from whence great confuſion would ariſe. For ſince, in inflammatory diſeaſes, a various event is foreſeen, and a different method of cure required, according to the particular part affected, it is thence evident, that the hiſtory of all thoſe diſeaſes ought to be delivered apart, though each of them are accompanied with a fever. Theſe are, indeed, juſtly called febrile diſeaſes; though, beſides the ſymptoms in common to all fevers, § 563, they are alſo accompanied with others, deſerving a particular regard, and ariſing, not from the fever, but from the part affected. Galen [1] has very well obſerved this, where he ſays, *Febribus vexari Veteres dicebant ægros, qui abſque aliqua inflammatione, vel abſceſſu, aut dolore, aut eryſipelate, aut, ſimpliciter loquendo, abſque aliqua parte præcipuè affecta, male habebant. Si vero vel propter lateris,*

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[1] Commentar. in Aphor. 73. Sect. IV. Charter. Tom. IX. pag. 184.

*teris, vel pulmonis, aut alterius cujuſdam ſimilis, inflammationem febricitarent, non vocabant illos febricitantes, neque febribus vexatos, ſed pleuriticos, peripneumonicos, hepaticos, ſplenicos, &c.* "The antients pronounce thoſe patients afflicted with a "fever, who find themſelves ill without any in- "flammation, abſceſs, pain, eryſipelas, or, ſimply "ſpeaking, without any particular part affected. "But if they are afflicted with a fever on account "of ſome inflammation in the ſide of the lungs, "or ſome ſuch other part, they did not denomi- "nate ſuch to be in a fever, but termed them "pleuritic, peripneumonic, hepatic, ſplenic, &c." namely, they derived the name of the diſeaſe from the part chiefly affected by the fever; and the ſame method or order was required in our ſyſtem.

In the ſame manner as a fever was lately ſaid to be acute, when accompanied with danger, and taking a ſwift courſe; ſo acute febrile diſorders are thoſe accompanied with ſuch a fever. But, generally, though not always, every acute diſeaſe is joined with ſuch a fever. Thus Sydenham [k] obſerves, that, during the firſt months in which the plague raged at London, there was every day people dropt down dead ſuddenly in the ſtreets, when they did not, in the leaſt, expect any thing ill from the contagion, which was blown to them; but that, when the diſeaſe grew older, no body died in this manner without being firſt taken ill with a fever, and other concomitant ſymptoms.

But when diſeaſes, ſlow in their own nature, are alſo accompanied with a ſlow fever, they are ſaid to be febrile or inflammatory, as well as chronical, as we obſerve in the worſt ſpecies of the ſcurvy, an inveterate dropſy, conſumption, and the like.

SECT.

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[k] Pag. 224. Sect. IV. cap. 2.

## SECT. DLXVIII.

HENCE it is evident, that the explanation of all thoſe, both acute and chronical febrile diſorders (§ 567.) is founded upon the previous knowledge of the nature of a fever.

The hiſtory of a fever ought, therefore, to be premiſed, before we can ſpeak in order of other diſeaſes, as may be obſerved more at large in the commentaries to § 558.

## SECT. DLXIX.

WHICH knowledge is to be derived from a conſideration of the three common ſymptoms (§ 563.)

There is only this one way of diſcovering the nature of diſeaſes, namely, by conſidering each of the ſymptoms or appearances of the diſeaſe by itſelf, rather than by comparing them with each other, and with what uſually happens in a ſtate of health, and from thence, by juſt reaſon, to diſcover the proximate cauſe of the diſeaſe; ſee § 13. But here great care ſhould be taken not to intermix any preconceived hypotheſis; for how egregiouſly have thoſe frequently erred, who, neglecting experience, or the obſervation of phænomena, have endeavoured to diſcover the cauſes of natural things by reaſoning only. For, as the incomparable Sydenham[1] prudently obſerves, in detecting the nature of diſeaſes;

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[1] Diſſertatio Epiſtolar. pag. 485.

eaſes; *Si mentem ſerio applicuerimus, quid de facto agat natura, & quibus in operatione ſua utatur organis, deprehendere valemus; modus tamen, quo illa operatur, aut ego fallor, ſemper latebit.* “If we “ſeriouſly attend to what nature actually performs, “and obſerve what inſtruments ſhe uſes in her “work, we may be able to diſcover her opera- “tions; but the manner in which ſhe operates, if “I am not miſtaken, will always be concealed.” For thus, by a conſtant obſervation, we diſcover in every fever, that the velocity of the pulſe is increaſed, and that therefore the heart contracts more frequently or ſwiftly; and thence again, that thoſe cauſes, from whence the contraction of the heart reſults, are increaſed: but in what manner thoſe cauſes act, which excite the heart to a quicker contraction, and after what manner, for example, an intermitting tertian is renewed every other day, when it afforded no action or appearances at all on the intermediate day; theſe are hitherto concealed from all of us. For all that we know of the nature of a fever, we diſcover only by its inſeparable effects and appearances; nor has any one hitherto ſucceeded according to their wiſh, who have endeavoured to know more. Therefore the three common, or inſeparable ſymptoms (§ 563.) are to be conſidered in order to diſcover the nature of a fever.

SECT.

## SECT. DLXX.

THESE ſymptoms, indeed, (§ 563.) attend in every fever; but then only the quick pulſe is preſent throughout the whole time of the fever, from the beginning to the end, and by that only the phyſician judges a fever is preſent.

The three mentioned ſymptoms or appearances, a ſhivering, quick pulſe, and heat, are always preſent in every fever, ariſing from internal cauſes, as we ſaid more at large in the commentaries to § 563. But, of theſe three, only the quick pulſe is always preſent, from the beginning to the end of the fever; for neither the ſhivering, or cold chill, nor heat, are obſerved throughout the whole time of the fever. In the greateſt cold of a quartan there is a fever; and even when a weak, old perſon is, in a manner, ſuffocated with a quartan in the midſt of winter, as hath been ſometimes obſerved before the hot fit, he will, notwithſtanding, be ſaid, by every one, to be dead during the febrile paroxyſm; and, therefore, a fever is preſent, though no heat is obſerved. Thoſe ſeem to trifle, indeed, who ſay, that a heat attends during the time of the febrile cold or chill, only that the heat is latent, and cannot be perceived. On the other hand, the heat ſometimes precedes, and is followed by the cold chill, and, therefore, the perſon is in a fever, although no ſhivering be then preſent. The quick pulſe is therefore the only ſymptom or appearance which always attends, not only in every fever, but alſo throughout the whole time of the fever. We may, therefore, ſafely appeal to all ſkilful phyſicians, whether they know how to diſtinguiſh a fever by any other ſign? Certain we are, that no ſign of fever remains, when, after the febrile cold, the heat gradually decreaſes to that of a healthy perſon, except only the increaſed quickneſs of the pulſe.

Galen [m], with the reſt of the Greek and Arabian phyſicians, places the eſſence of a fever "in a "preternatural heat, largely diffuſed throughout "the whole animal, or, at leaſt, kindled through- "out the greater part, or through the moſt noble "parts:" *In caliditate præter naturam, maximè quidem in totum animal effuſa; ſin minus, at omnino vel in pluribus partibus, vel in nobliſſimis accenſa.* And, in the ſame place, he condemns the opinion of Eraſiſtratus and Chryſippus, who would have the eſſence of a fever conſiſt in the motion of the arteries. But, in the ſame place, Galen obſerves, that although the whole ſkin ſometimes affords no ſign of preternatural heat neither to the phyſician's touch, nor to the patient himſelf, yet, at the ſame time, there is a heat perceived within the body, and the viſcera ſeem to be burnt up; and thus he endeavours to prove that a preternatural heat attends every fever, and conſtitutes the eſſence thereof. This is indeed true in fevers of the worſt kind, where the patient perceives a burning heat in the internal parts, and eſpecially in the vital organs, although the extremities of the body are at the ſame time hardly warm, or even perfectly cold. But in the fit of a quartan or tertian, the patient perceives a moſt ſevere cold, though there is no increaſed heat perceived internally at that time, but both external and internal parts are equally ſenſible of a coldneſs. Hence it is evident, that a fever may exiſt without a preternatural heat, and that therefore its eſſence does not conſiſt in an increaſed heat.

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[m] Comment. I. in Lib. VI. Epidem. ad text. 29. Charter. Tom. IX. pag. 382, 383. & alibi pluribus in locis.

I believe it will be therefore apparent, to every one who conſiders what has been ſaid, that there is but one eſſential ſign of a fever being preſent, namely, a too quick pulſe: and thus, at the ſame time, it will alſo appear, that the eſſence of a fever, which, at firſt, ſeemed intricate, may be reduced to the greateſt ſimplicity by juſt reaſoning, and ſeparating all thoſe ſymptoms or appearances from the fever, which only attend at ſome certain times, and which may be ſeparated from the fever. For, in this place, we treat of the generical or ſimple idea of a fever, which agrees with every fever of what kind ſoever; for the reſt of the ſymptoms or appearances, as was demonſtrated before, are either not preſent throughout the whole time of the fever, or elſe ſerve to diſtinguiſh the ſeveral ſpecies of fevers, but not at all to conſtitute what is properly called the eſſence of a fever.

## SECT. DLXXI.

AND, therefore, whatever the phyſician knows of a fever, is entirely derived only from the quickneſs of the pulſe; but, after death, every fever ceaſes.

That an increaſed velocity of the pulſe only, ſhould be taken for an infallible and pathognomonic ſign of a fever, has, for its ſimplicity, been thought much of, and proved diſpleaſing to many; and this, more eſpecially, as the quickneſs of the pulſe is obſerved to increaſe by ſuch ſlight cauſes, as produce little or no diſturbance throughout the reſt of the body. This has been well obſerved by Celſus[n], where he treats of the time when febrile patients ought to take ſolid or fluid aliment, and concludes, that a remiſſion or ceſſation of the fever are moſt convenient for this purpoſe, and that the whole difficulty conſiſts in rightly knowing this. *Venis enim maximè credimus, fallaciſſimæ rei; quia ſæpe iſtæ lentiores celerioreſve ſunt, & ætate & ſexu, & corporum natura. Et plerumque ſatis ſano corpore, ſi ſtomachus infirmus eſt, nonnunquam etiam incipiente febre, ſubeunt & quieſcunt: ut imbecillus ille videri poſſit, cui facile laturo gravis inſtat acceſſio. Contra ſæpe eas concitat & reſolvit ſol, & balneum, & exercitatio, & metus, & ira, & quilibet animi affectus. Adeo ut, cum primum Medicus venit, ſollicitudo ægri dubitantis, quomodo ille ſe habere videatur, eas moveat. Ob quam cauſam periti Medici eſt, non protinus ut venit, apprehendere manu brachium, ſed primum reſidere hilari vultu, percunctarique, quemadmodum ſe habeat, &, ſi quis ejus metus eſt, eum probabili ſermone lenire, tum deinde ejus carpo manum admovere. Quas autem venas conſpectus Medici movet, quam facile mille res turbant!* “Indeed we rely much upon the pulſe, when it is a thing extremely fallacious, becauſe the arteries are often quicker or ſlower, according to the age, ſex, and habit of body. And, for the moſt part, if the ſtomach is out of order, though the reſt of the body be well enough in health, the pulſe will be increaſed and intermit, as ſometimes in the beginning of a fever; ſo that thence a patient may eaſily ſeem weak, who is about to be taken with a ſevere paroxyſm or increaſe of the fever. On the other hand, the heat of the ſun, warm bathing, exerciſe, fear, anger, and other paſſions of the

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[n] Lib. III. cap. vi. pag. 129.

" mind, frequently raiſe or depreſs the arteries; " ſo that when a phyſician comes firſt to a patient, " he may be under a doubt with reſpect to the apparent ſtate and motion of the pulſe from the " patient's ſurpriſe. For this reaſon it is the cuſtom of a ſkilful phyſician, not immediately to " lay hold of the patient's arm with his hand, as " ſoon as he comes in, to feel the pulſe, but to " ſit down a while firſt with a chearful countenance, " and to enquire how he finds himſelf, and if he " appears afraid or dejected, to encourage him " with ſome good words, and then to apply his " fingers to the wriſt, in order to examine the " pulſe. But how eaſily may a thouſand things " diſturb thoſe arteries which are influenced by " the approach or ſight of the phyſician!" But, in another place[o], treating of the time when nouriſhment ought to be given to febrile patients, he ſeems to attend principally to the quickneſs of the pulſe, and, from that alone, to judge whether the fever was abſent or not. For, he ſays, *Illud enim magis ad rem pertinent, ſcire, cibumne oporteat dari, cum jam bene venæ conquieverunt, aut etiamnum manentibus reliquiis febris.* " For it is one of the " moſt material points, to know whether aliment " ought to be given, when the arteries are " well compoſed or quieted, or whether it ſhould " be given while the remains of the fever continue " upon the patient."

But, even thoſe, who following the opinion of the ancients, place the eſſence of a fever in the preternatural heat, are embarraſſed with the ſame difficulties; for, upon heat alſo, Celſus[p] made the following remarks; *Altera res eſt, cui credimus, calor, æque fallax. Nam hic quoque excitatur æſtu, la-*

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[o] Lib. III. cap. 4. pag. 122.

[p] Lib. III. cap. 6. pag. 129.

*labore, ſomno, metu, ſollicitudine.* "The other "ſign, heat, upon which we rely, is equally fal"lacious; for this is alſo increaſed by the heat "of the weather, labour, ſleep, fear, cares, &c. But it was not in the power of Celſus to give us more certain ſigns, whereby to diſtinguiſh the preſence or abſence of a fever: and, a little after, he ſubjoins; *Ac protinus quidem ſcire, non febricitare eum, cujus venæ naturaliter ordinatæ ſunt, teporque talis eſt, qualis ſanis eſſe ſolet:* "That one may, "indeed, immediately know he is not in a fe"ver, whoſe arteries beat naturally, and whoſe "heat is ſuch as it uſually is in health:" And yet, he would not have us conceive, that a fever attends merely from heat and motion, unleſs there are alſo other ſigns of the functions injured, which he afterwards enumerates: but then, as we have often ſaid before, theſe other ſigns do not make the eſſence of the fever, but are only accidental companions of it.

This has been, therefore, the principal difficulty, which has hindered many from admitting this, ſo ſimple idea of a fever, namely, becauſe the motion of the artery is accelerated by increaſed exerciſe, paſſions of the mind, very full diet, and the like cauſes ſlight enough in themſelves: whence it would follow, that a perſon ought, in this caſe, to be reckoned in a fever, when, at the ſame time, every one will ſay, he is well. Certain it is, that a true fever attends in theſe caſes, which vaniſhes immediately upon the ceſſation of thoſe ſlighter cauſes; but thoſe very ſame cauſes being more violent, or longer continued and applied to the body, may excite the moſt dangerous fevers. Does it not appear, from frequent obſervation, that the moſt ardent fevers have aroſe from too violent exerciſes of body? And thus, alſo, gluttony has often raiſed a dangerous fever, and many, by exceſs of wine, have periſhed apoplectic with an acute fever, as we are taught from medical hiſtory. It is not therefore in the leaſt diſagreeable to reaſon, that a ſlight and momentary fever ſhould be excited from ſlight cauſes, in the ſame manner as the moſt acute fevers are often raiſed by the ſame, but more violent cauſes. Every fever which terminates within the ſpace of twenty-four hours, without returning again, is, by the general conſent of phyſicians, termed an ephemera; and this generally ariſes from ſome ſlight error in diet. But if ſuch a fever terminates its courſe within the ſpace of two hours, it is, nevertheleſs, called a fever: and therefore what ſhould hinder us from calling the ſame diſeaſe a fever, if it continues only a quarter of an hour, or even a ſhorter ſpace of time? I believe, that to one who carefully conſiders all theſe particulars, there will not appear any thing abſurd in the general definition of a fever, which is taken only from the quickneſs of the pulſe; ſince ſuch a definition ought to comprehend, as well the leaſt as the greateſt fever, as a genus includes all the ſpecies.

But whereas this difficulty was oppoſed to the opinion of the antients, concerning the nature of a fever, in order to avoid it, Galen [q] ſays, *Febrem eſſe, cum adeo immoderate auctus calor eſt, ut & hominem offendat, & actionem lædat: quod ſi neutrum adhuc efficiat, quantumvis ſi homo nunc quam ante calidior, non tamen fabricitare eum monſtravimus.* "That a fever is when the heat is ſo "immoderately increaſed, as to injure the perſon "and his faculties or actions; but if it has neither of theſe effects, though the perſon may be "now

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[q] Method. med. Lib. VIII. Cap. 1 Charter. Tom. X. pag. 179.

“ now hotter than before; yet, we have demon-“ ſtrated, that he is not in a fever.” This kind of reaſoning has been handed down to us out of Galen, by the other Greek and Arabian phyſicians, who have wrote after him, according to their uſual cuſtom of copying him almoſt in every thing; but among theſe, Avicenna [r] ſecludes, by expreſs words, a heat ariſing from anger or exerciſe, when he ſays: *Febris eſt calor extraneus accenſus in corde, & procedens ab eo, mediantibus ſpiritu & ſanguine, per arterias & venas in totum corpus: & inflammatur in eo inflammatione, quæ nocet operationibus naturalibus, non ſicut caliditas iræ & laboris, &c.* “ That a fever is an extraneous heat, kind-“ led in the heart, and proceeding from thence by “ means of the ſpirits and blood by the arteries “ and veins throughout the whole body, which “ becomes inflamed in this inflammation, ſo as to “ hurt its natural actions or operations, which does “ not happen in the heat ariſing from anger, exer-“ ciſe, *&c.*”

Hence again, it has been the opinion of ſome, that a fever might be better defined by an increaſed velocity of the pulſe, with an injury of the functions. But, as various functions are injured in different fevers, it is again evident, that the quickneſs of the pulſe only can define a fever in general, and that the functions injured may diſtinguiſh the ſeveral kinds of fevers. Nor is it any objection to this definition, that every diſeaſe ſuppoſes ſome function injured; (ſee §. 1.) and that therefore the ſame may be ſuppoſed in a fever, as that is a diſeaſe: for in reality the increaſed velocity of the pulſe itſelf, is an injury of the heart’s action; and therefore it is evident, that a fever may, by this great ſimplicity of its nature, be comprehended under the general definition of a diſeaſe, and that, ſtrictly ſpeaking, it never attends without injuring, at leaſt, ſome one of the functions.

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[r] 1 Canon. Lib. IV. Tract. I. cap. 1. Tom. II. pag. 1.

Moreover, that ought to be termed the chief, individual, and pathognomonic ſign of a diſeaſe, which, being preſent, the diſeaſe itſelf muſt be allowed by every one to be alſo preſent, and which, being abſent, the diſeaſe will be alſo abſent: but, among the three ſigns common to all fevers (§. 563.) namely, the ſhivering, or cold chill, quick pulſe, and increaſed heat, there is none but the quickneſs of the pulſe which continues throughout the whole courſe of the fever, even till it terminates in death, and the body gradually grows cold; though ſometimes, but rarely, a ſomewhat intenſe heat remains a conſiderable time after. Thus I ſaw a young man, who, being delirious in the confluent kind of ſmall-pox, ſuddenly expired on the eleventh day, and there was a very conſiderable heat in the extreme parts of his body, even two hours after death. It was alſo obſerved, upon another occaſion, (under §. 85.) that the body of an infant, dead of the plague, continued warm even on the ſecond day after it expired.

To this it may perhaps be objected, that we very rarely meet with any mention of the pulſe in fevers, throughout the works of Hippocrates; when at the ſame time, according to what has been before advanced, a fever can be only known by the quickneſs of the pulſe. Galen[s] has recorded Hippocrates to have been the firſt that he knew, who had committed the name of pulſes to writing, and that he could not ſeem to be ignorant of the art which he mentioned; and yet he obſerves to us, that Hippocrates did not make any great proficiency

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[s] De pulſuum differentiis Lib. I. cap. 2. Tom. VIII. pag. 15.

ency in this branch of the art, and that he did not attribute this name to the motion of every artery. But in the mean time it is evident, from ſeveral paſſages in Hippocrates, that he examined the pulſe in ſick people, and that he judged of the violence of a fever by the pulſe. Thus, in his Coan Prognoſtics[t], he ſays, *Lethargicorum pulſus tardos eſſe.* "That the pulſations in lethargic patients are "ſlow." And, in another place[u] that he found, *In Zoilo fabro pulſus tremulos tardos.* "The pul"ſations ſlow and trembling in Zoilus the work"man. *In Polycrate febris adeo lenis erat, ut obſcure, præterquam in temporibus, conſiſteret*[w]. "That in Polycrates the fever was ſo gentle, that "the pulſe ſeemed obſcurely to ſtand ſtill, except "in the temples." And in another place, again he obſerves, *In acutiſſimis febribus pulſus maximos & denſiſſimos eſſe.* "That in the moſt acute fevers, "the pulſations are the largeſt and hardeſt[x]." Many other paſſages might be produced out of Hippocrates, from whence it is evident, that he obſerved the pulſe: but, I think, thoſe here mentioned are ſufficient.

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[t] No. 140. Charter. Tom. VIII. pag. 859.

[u] Epidem. Lib. IV. Charter. Tom. IX. pag. 320.

[w] Epidem. Lib. VII. text. 2. Charter. Tom. IX. pag. 552, 553.

[x] Epidem. Lib. IV. Charter. Tom IX. p. 518.

## SECT. DLXXII.

THE proximate cauſe therefore of the velocity or quickneſs of the pulſe (§ 571.) is likewiſe the proximate cauſe of the fever thus known.

Since it has been abundantly proved, as I think, that the nature of a fever conſiſts in the quickneſs of the pulſe, it is therefore evident, that every thing which can produce the velocity of the pulſe, as a cauſe, may be alſo the cauſe producing the fever. For the proximate cauſe of a diſeaſe, as we have obſerved in the comment to § 11. is that whoſe preſence makes the diſeaſe, and whoſe abſence removes it.

## SECT. DLXXIII.

THIS cauſe is therefore a quicker contraction of the heart. And therefore it is an affection of life, endeavouring to avoid death, as well in the cold chill, as in the heat of the fever.

Since Harvey has taught us that the blood contained in the cavities of the heart, is by the contraction of that muſcle drove through the arteries, and returned into it again through the veins, to be ſent from it, as before, through the arteries, ſo long as life continues; there is no one, I believe, doubts, that the dilatation of an artery which is perceived in the pulſe, is made by the contraction of the heart. For when the heart is contracted, the valves being raiſed with a wonderful artifice (as explained at § 165 to 182, of the Inſtitutions of our celebrated author) ſhut the venal orifices of the heart; whereupon all the blood contained in the cavities of the heart is expreſſed by the open orifices into the arteries, which are always full and converging. From hence neceſſarily follows a dilatation of the arteries, as they are flexible canals; and the moment after this, while the heart ceaſes to contract, the dilated arteries, by their own elaſticity and action of their muſcular fibres, are contracted, until they are again dilated by the repeated action of the heart. But during that moment of time that the artery is dilated by the blood impelled by the heart, the artery ſtrikes againſt the finger, which is called the pulſe; and therefore the artery beats as often as it is dilated. Since therefore the dilatation of the artery is contemporary with the contraction of the heart, the pulſe cannot be accelerated without the contraction of the heart becomes quicker at the ſame time, as that is the only and entire cauſe of the dilatation of the arteries. For all that has been ſaid by ſome authors concerning ebullition, fermentation, of effervescence of the blood, &c. in the cavities of the heart, has been proved to be falſe, and directly contrary to experiments[y]; and it appears, with the greateſt certainty, that the cauſe propelling the blood from the heart into the arteries, does not reſide in the blood itſelf, but in the heart, which immediately receives the blood.

A fever may therefore be deſervedly called a diſeaſe of the heart, ſince in every fever the action of that muſcular organ is changed, namely, by being brought into more frequent or quicker contractions. Even the antient phyſicians, though ignorant of the circulation of the blood, were yet of opinion, that the heat, which they ſuppoſed to conſtitute the nature of a fever, was kindled in the heart itſelf. Thus Galen[z] tells us, *Febris exiſtit, quum calor quidem præter naturam in corde generatur.* "That a fever exiſts when a preternatural heat is generated in the heart." In a fever, therefore, life is attacked in its very ſpring or fountain, the heart itſelf: for ſo long as the venal blood continues to be received into the cavities of the heart, and to be expelled from thence by its muſcular force into the arteries, life is ſaid to be preſent; but when that action of the heart ceaſes, life departs, and the animal dies. But to continue this action of the heart, requires that all the blood contained in its cavities be, in each contraction, expelled into the arteries; for if the heart retained the leaſt portion of blood at each ſyſtole, (ſince it contracts at leaſt four thouſand times within the ſpace of an hour, in a healthy perſon) it would in a little time be filled up, and its motion ſuppreſſed; that is to ſay, death muſt follow; but, for the heart to expel its contained blood into the arteries, requires theſe laſt to dilate and tranſmit the blood, which they formerly received from the heart, through their ſmalleſt extremities: every thing therefore which impedes the motion of the blood through the arteries, diſpoſes to death; that is, to ſtop the heart, whether it be from any defect in the contained blood, or in the contained veſſels. Now it is obſerved, that the motion of the heart becomes quicker, as ſoon as ever there are ſuch obſtacles impeding the free expulſion of the blood from the heart. Thus a perſon who is ſuddenly affrighted, looks all over pale, and at the ſame

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[y] Vide Inſtitutiones Medicæ Boerhaavii §. 165. ad 182.

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[z] De different. febr. Lib. I. cap. 3. Charter. Tom. VII. pag. 109.

time, the heart immediately palpitates very ſwiftly, becauſe the veins being contracted, urge the blood more ſwiftly towards the heart, and the arteries being contracted or leſſened, make a greater reſiſtance to the blood to be expelled out of the heart. In the diſſection of living animals, the heart moves ſo much quicker in proportion as death is nearer; and hence, in thoſe laſt ſtruggles which happen betwixt life and death, the contractions of the heart are obſerved to be ſo quick that no body can number them. It is therefore evident, that the motion of the heart becomes accelerated, whenever there is danger of death by ſtopping its motion; for the machine of our bodies is obſerved to be ſo formed, as to uſe the greateſt endeavours to remove theſe obſtacles, till being overcome by the impediments, the machine does at laſt reſt. Since therefore in every fever the motion of the heart is accelerated, it is here juſtly ſaid to be an affection of life, endeavouring to avoid death. The truth of this is moſt apparent in the cold fit of a fever, in which the coldneſs of the extremities manifeſtly denotes that the blood cannot be propelled to the ultimate branches of the arteries; and therefore there are obſtacles in this caſe, which were not before. But, at that time, the pulſe is obſerved to be quick and ſmall together, while the irritated heart endeavours, with all its force, to overcome the reſiſtances; but when the febrile cold is followed with heat, the increaſed velocity of the heart's motion will continue, until the cauſe, which diſturbed the equability of the circulation, is either diſcharged from the body, or elſe ſo ſubdued and altered, as to be no longer hurtful; and thus the equable circulation of the humours returns to the ſtate required in health. Hence, again, appears the truth of what was ſaid at § 558, namely, that a fever is often happily the cauſe of recovery.

It was not therefore without reaſon, that Helmont[a] affirmed, *Attamen ipſa vita ſemper eſt intimum principale, formale, atque eſſentiale febrium efficiens, manetque ubivis materia occaſionalis extra veram & internam cauſam materialem.* "That "life itſelf is always the moſt intimate, formal, "principal, eſſential and efficient cauſe of fevers, "and that without any occaſional matter it remains "the true, internal, and material cauſe." For very numerous and different cauſes may excite a fever, either by an irritating ſtimulus, or by obſtructing the free circulation of the humours, as we ſhall explain hereafter at § 586. Yet the fever itſelf thus produced, is diſtinct from theſe cauſes, and appears from what has been ſaid to conſiſt only in a quicker contraction of the heart.

## SECT. DLXXIV.

THIS quicker action of the heart therefore infers a quick reciprocal influx of the nervous fluid, from the cerebellum into the muſcular fibres, as well as a quicker influx of the blood into the veſſels and cavities of the heart.

We have made it evident in our Inſtitutes, or academical lectures on the theory of phyſick[b], that the heart is truly a muſcle, and that its contraction is performed, while all the muſcular fibres, ſhortening together, diminiſh the length of the heart, increaſe its breadth, and accurately leſſen the capacity of its ventricles; and that therefore the muſcular motion of the heart proceeds from the ſame or the like cauſes with thoſe which move the other muſcles of the body. But it is directly proved by experiments[c], that a free influx of ſpirits through the nerves, and of blood through the arteries into the ſubſtance of the muſcles, is neceſſary to enable them to contract: and therefore the ſame cauſes are required towards the contraction of the heart, as we have alſo proved by thoſe experiments mentioned in the comment to § 170. No. 1. (4.) where we treated of ſuch wounds as were abſolutely mortal, by injuring the cardiac nerves. But, ſince as long as life continues, the heart alternately becomes at one time paralytic, and is in the next inſtant contracted with a ſort of convulſive or ſwift motion; therefore theſe moving cauſes or powers muſt be applied to the heart alternately, and not continually. But it appears from the principles of anatomy and phyſiology, that the muſcular motion of the heart, when in action, does, by a neceſſary mechaniſm, render its own muſcular fibres paralytic, and that by this means, the whole heart is ſo diſpoſed, that a new contraction muſt follow the moment after. For the nerves ſent to the heart are ſo ſituated, that they muſt be compreſſed by the dilatation of the largeſt arteries, diſtended by the blood expelled from the heart, namely, the aorta and pulmonary artery, during the dilatation of which the venous ſinuſes and auricles of the heart are likewiſe diſtended; and therefore the influx of the ſpirits through the nerves, into the muſcular fibres of the heart, is thus impeded, while at the ſame time all the blood is expreſſed through the veſſels, diſperſed through the ſubſtance of the heart, which therefore looks pale during its ſyſtole. Thus the two cauſes, which are abſolutely required to muſcular motion, are intercepted or removed; namely, the influx of ſpirits and arterial blood. But in that moment of time while the heart, as it were paralytic, has its cavities filled by the influent venal blood, the aorta is contracted, and with great force urges the blood through the orifices of the coronary arteries throughout the whole ſubſtance of the heart; and, at the ſame time, the nerves are no longer compreſſed, as the arteries are then contracted, and the ſinuſes and auricles emptied, whence they freely tranſmit the ſpirits ſent from the cerebellum through the cardiac nerves to the heart; and therefore the two cauſes of muſcular motion will be renewed, and thence the contraction of the heart will be inſtantly repeated.

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[a] De Febribus in fine capit. XVI. pag. 783.

[b] H. Boerh. Inſtit. Medic. § 187.

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[c] H. Boerh. Inſtit. Medic. § 401.

But beſides thoſe cauſes of muſcular motion which the heart has in common with the other muſcles of the body, there ſtill remains another cauſe; namely, the venal blood flowing into its auricles and ventricles. For we are taught by wonderful obſervations, that the motion of the heart may be renewed in dead bodies, if, by inflating the veins, the blood is urged into the cavities of the heart. Peyerus [d] has obſerved in a dead cat, which had lain a long time ſtiff, that, upon blowing into the receptacle of the chyle, firſt the auricles, and then ſoon after the whole heart vibrated very often, and for ſeveral hours: he alſo obſerves, that this experiment is promoted by warmth, and that it even ſucceeds in dead bodies of the human ſpecies. He made the heart renew its pulſation in a ſtork, an hour after it had been killed by poiſon, merely by blowing air through the aorta. The like experiments are related by Wepfer[e]. If therefore the alternate motions of the heart could be thus renewed in a dead body, by impelling the blood or air into its cavities, how much more muſt this happen in the living animal, while the warm blood is impelled in large quantities, by a powerful contraction of the auricles and venous ſinuſes? It is therefore no wonder that the venal blood, being accelerated in its motions towards the heart by frictions, ſhould increaſe the quickneſs of its contractions, and be able to excite a true fever.

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[d] Parerg. Anatom. pag. 199. 201. pag. 297. 304.

To render therefore the contractions of the heart quicker, one or all of the forementioned cauſes muſt be increaſed, or elſe more frequently applied to the heart in a given time.

From hence then we begin to ſee, that though the proximate cauſe of a fever may be reduced to ſuch great ſimplicity, yet thoſe cauſes may be very numerous which are capable of increaſing the cauſes of the heart's contraction, or which may apply them oftener to that muſcle in a given time. For every thing which is capable of diſturbing the equable motion of the moſt ſubtle fluid through the nerves; as for example, violent paſſions of the mind, a diſorder of the encephalon, of the nerves, or of the heart itſelf, may have this effect. And again, all the cauſes which accelerate the motion of the venal blood towards the heart; as alſo a great many defects of vices in the circulating humours themſelves, whether ariſing from a ſpontaneous depravity, or from their mixing with ſuch particles from without, as by their ſtimulus may cauſe the heart, (which is ſo eaſily irritable, ſee the comment to § 1.) to make quicker contractions: concerning which we ſhall treat more largely hereafter.

SECT.

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[e] Hiſtor. Cicutæ aquat. cap. 21.

## SECT. DLXXV.

ALMOST every fever as yet obſerved, and ariſing from an internal cauſe, begins firſt with the ſenſe of cold, ſhivering, and trembling, more or leſs, of longer or ſhorter duration, and either internal or external, according to the diverſity of the ſubject or patient, and of the cauſes of the fever itſelf.

It was declared, in the commentaries to § 563, what ſort of a fever might be ſaid to ariſe from an internal cauſe; namely, when the cauſe pre-exiſted ſome time in the body before the fever appeared. Almoſt the firſt ſign or ſymptom felt by a perſon going to have a fever, is an unuſual coldneſs, which at that time is generally aſcribed to ſome other cauſe, while they are well, and ſuſpect nothing ſo little as a fever. Soon after this the whole body begins to ſhake or tremble, almoſt in the ſame manner as when a perſon, going out of a hot-houſe or warm bath, is ſuddenly expoſed to great cold. But the degree of this coldneſs, with which the fever begins, is obſerved to be various, and more or leſs as to the time of duration; but generally the external parts of the body, and chiefly the extremities feel the cold, which is ſometimes alſo perceived by the internal parts, while the external ſkin is but naturally hot; ſometimes alſo in the worſt fevers there is a moſt intenſe burning heat perceived about the præcordia, while the extremities are as cold as marble. But more eſpecially does the degree of febrile coldneſs differ according to the variety of ſubjects. For the cold, which accompanies an incipient fever, is (*cæteris paribus*) much greater in a decrepid old man, than in a ſtrong youth, and greater in a cold leucophlegmatic body, than in one abounding with blood and good juices; becauſe in theſe caſes the patient's habit or temperature is naturally more inclined to cold. The febrile cold alſo frequently varies agreeable to the cauſe. For in the moſt malignant and dangerous fevers, the moſt intenſe and long continued coldneſs has been often obſerved, as we ſhall declare hereafter at § 623, where we are to treat of febrile coldneſs. For in ſuch fevers the cauſe is ſo averſe to nature, as to immediately infringe all the vital powers; whence the unfortunate patient, oppreſſed by the violent onſet of the diſeaſe, has a ſevere and long continued chillneſs. The like diverſity of coldneſs is alſo obſerved, according to the different nature of the fever itſelf. A quartan is uſually accompanied in the beginning of a fit, with a violent and long continued coldneſs; but in the beginning of a fever of one day's continuance, there is often only a very ſlight ſenſe of coldneſs perceived.

## SECT. DLXXVI.

DURING which time of the fever (§ 575.) the pulſe is often quick, ſmall, and intermitting; the extremities are often pale, cold, ſtiff, trembling, and inſenſible.

Quickneſs of the pulſe is indeed obſerved throughout the whole time of the fever, as was ſaid before at § 570; but, during the time of the febrile cold, there is always a great weakneſs perceived in the pulſe, as well as quickneſs; whereas, on the contrary, in the heat of the fever the pulſe ſtrikes againſt the fingers of the phyſician very ſtrong and full, or large as well as quick. But very often there is ſo great a weakneſs obſerved in the pulſe, during the cold fit of a fever, that the ſtroke of the artery is hardly perceptible to the touch, and this more eſpecially in old people afflicted with a quartan fever in the winter time; and then alſo the quickneſs of the pulſe is ſo great, that it ſeems rather to tremble, than to be made up of a diſtinct dilatation and contraction. But where there is ſo great a celerity of the pulſe as to be ten times quicker than what is natural, no body can diſtinguiſh its numbers; but there is only a ſurpriſing undulatory motion perceived by the finger; and if the hand be applied to the breaſt, the heart ſeems to tremble, inſtead of beating powerfully againſt the ribs, as is uſual in health: and in this caſe, ſometimes the artery will give a ſtronger dilatation, and then again appear extremely weak and quick, and ſometimes a true intermiſſion of the pulſe may be diſcerned in this caſe; and then the patient often complains in ſuch a fever, that ſometimes his eyes are blind, or that he cannot hear, or ſcarcely perceive. In this caſe, the ſame thing ſeems to take place, which appears to the eye before death in the diſſection of living animals: for we then ſee that the heart, being no longer able to expel its contained blood at each ſyſtole, trembles, and evacuates only a part, not being able to make any great dilatation of the arteries: in the mean time, the auricles and venous ſinuſes are greatly diſtended, and, after a few moments of time, they are ſuddenly contracted, forcibly projecting their blood into the ventricles of the heart; which being then irritated by the quantity and impetus of the influent venal blood, is very powerfully contracted; then again trembling with a languid motion, until it be excited by the ſame cauſe, or until all motion ceaſes in the death of the animal. For, at this time, the greateſt anxiety, moſt difficult reſpiration, and even the ſtruggles of life with death, ſeem frequently to attend a fever, as we ſhall declare hereafter at § 589. Hence Galen [f] juſtly pronounces; *In quartanarum principiis videbitur tibi arteria quodammodo eſſe alligata, atque ad interiora retracta, & prohiberi, ne inſurgat.* "That in the beginning of quartans, the artery "will ſeem to you, in a manner, as if it was tied "up, and drawn inward, ſo as to prevent it from "dilating." From what has been ſaid, it is eaſy to explain another paſſage in Galen [g], where he places the moſt certain ſign of an incipient quartan in a ſlowneſs and ſmallneſs of the pulſe. For in the heighth of the cold fit the artery is often agitated with a tremulous and obſcure motion, and then after a few moments, one ſhall be able to perceive a ſingle and violent ſtroke or dilatation of the artery, which will then ceaſe, and return again ſoon after: ſo that if one numbers thoſe violent pulſations, the artery will ſeem to beat ſlow, when, at the ſame time, during the ſuppoſed intervals, it is extremely quick and weak in its motion. Add to this, that ſometimes for a few moments the motion of the artery is intirely aboliſhed, and a true ſyncope takes place. Hence it appears in how great danger the patient is at that time, and why death ſometimes takes place in the cold fit.

At the ſame time alſo paleneſs is an uſual ſymptom, beginning almoſt conſtantly in the extreme parts of the body, and therefore appearing firſt in the tip of the noſe, corners of the eyes, and fingers ends; ſo that when the nails (which have a ruddy colour in healthy people, from their being in ſome meaſure pellucid, and from the ſubjacent blood-veſſels) begin to look pale, thoſe afflicted with a quartan know that a fit is at hand. But that lively colour obſerved in a healthy perſon, ariſes from the veſſels filled with red blood, ſo that when the force of the heart begins to be weakened from any cauſe, not being able to propel the blood to the extremities of the body, and the arteries at that time contracting by their own elaſticity, eſpecially towards their extremities, which are the leaſt urged by the force of the heart, the blood is by that means repelled from the ſmaller into the larger branches; therefore the ſubcutaneous arteries, which are ſome of the ſmalleſt in the body, will be in a great meaſure emptied, whence a paleneſs will ariſe. For by this ſame cauſe we ſee, that a great paleneſs may ariſe without any loſs of blood, when a puſillanimous man ſeeing the blood flow from the vein of another, is himſelf affrighted; for immediately after the face and hands are obſerved to turn pale, and frequently a true ſyncope or fainting enſues. From the ſame cauſe alſo a perſon looks pale by cold, when the ſmall cutaneous arteries being contracted, repel their contained blood into the larger veſſels; and therefore it is that external cold increaſes the paleneſs ariſing in the cold fit of a fever. In the greateſt ſeverity of the cold fit, the paleneſs is alſo uſually accompanied with a livid colour, eſpecially in the lips, becauſe then the blood begins to ſtagnate in the veins, for want of the motion of the arterial blood, and from the larger veins and ſinuſes next the heart, with the whole lungs, being overcharged with blood. But the blood contained in the almoſt pellucid veins, gives a blue colour to the ſkin, which being intermixed with paleneſs, cauſes the livid colour, as it appears in dying people. Therefore in the cold fit of a fever, which is violent, and of long continuance, there are obſerved a great many ſigns of approaching death.

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[f] Lib. II. de Criſibus cap. 3. Charter. Tom. VIII. pag. 412.
[g] Ibid. cap. 4. pag. 413.

Coldneſs.] It was demonſtrated, in the commentary to § 100, where we treated on the effects of an increaſed circulation, that an increaſe of heat always proceeds from an increaſed motion of the circulation; and, on the other hand, that the heat decreaſes, as the circulation is diminiſhed. Since, therefore, the force of the heart is in this ſtage of the fever ſo much weakened, that it cannot propel the blood to the extremities, it is evident enough coldneſs muſt be produced; for, ſo ſoon as the cauſes exciting animal heat in the body are deficient, all the parts expoſed to the common air are reduced to the ſame temperature with itſelf, and they are then ſaid to be cold, becauſe the natural heat of our body always exceeds the heat of the air.

Stiff.] To maintain a due flexibility in the parts of the human body, requires ſuch a coheſion of the ſolids as will enable them to be elongated, and to give way to thoſe motions to which they ought to be obedient for the exerciſe of all the functions in a juſt manner. It was ſaid before upon another occaſion in the comment to § 43, that the human body was ſo much ſofter and more flexible, as it was younger or nearer its origin, becauſe then the ſolid parts are the moſt tender, and the fluids abound in the greateſt quantity; but as age advances, great numbers of the ſmall veſſels, after expelling their contained humours, concrete together, whence the body becomes firmer, but leſs flexible, till at length, in a decrepid old age, the whole in a manner becomes rigid or inflexible. Hence it is evident, that the parts are more pliable, in proportion as there is a greater abundance of humours with reſpect to the ſolid parts; but in the beginning of a fever, the force of the heart being weakened, cannot fill the ſmalleſt veſſels in the extreme parts of the body; and therefore theſe being contracted, and repelling back their contained juices into the larger veſſels, this will be one cauſe of the rigor or ſtiffneſs in the beginning of fevers. But beſides this, the cold, which contracts every thing, will increaſe the coheſion of the ſolid parts, and conſequently augment their ſtiffneſs: and the truth of this every one have experienced, who have had their hands extremely cold in the winter time; in conſequence of which the fingers have been ſo ſtiff, as to be ſcarce able to take hold of any thing. Since therefore theſe two cauſes concur, it is no wonder that a very great ſtiffneſs often ariſes in the time of the cold fit in fevers.

A trembling ſuppoſes a ſhort, involuntary, and mutual ſucceſſion of the cauſes, which contract and relax the muſcles, as will be hereafter explained more at large under § 627, where we treat profeſſedly of febrile tremors. But the cauſes diſtending the muſcles are an influx of the arterial blood, and of the ſpirits by the nerves. But the pulſe being quick, ſmall, and often intermitting, demonſtrates that the motion of the arterial blood is irregular or wavering, or that it is deficient one moment, and urged in again the next. But alſo the motion of the ſpirits through the nerves requires the continued motion of the arterial blood through the veſſels of the encephalon; and therefore this courſe of the blood being interrupted or wavering, will likewiſe diſturb the equable motion of the ſpirits through the nerves. The two cauſes of muſcular motion therefore being thus wavering, will produce a trembling; and that often ſo violent, that after the fit is over all the limbs are in pain for ſome time from the violent concuſſions.

Inſenſibility, which is only obſerved in the greateſt ſeverity of the febrile cold; for then the blood is accumulated, and ſtagnates in the larger veins and ſinuſes about the heart, while but a little of it only can be propelled through the lungs by the weak action of the heart, as is evident from the great anxiety which then always attends. The jugular veins therefore cannot freely empty themſelves at that time, whence the encephalon is overcharged, ſo that the patient can hardly be ſenſible of any thing further, but lies heavy and ſtupid, inſomuch that by ſad experience we find, the unfortunate patient has ſometimes burnt the ſoles of his feet to the bone, without any ſenſe of pain, by applying them to the ſtove to leſſen the painful ſenſe of cold. Beſides this, the cold itſelf of the extreme parts will alſo increaſe their inſenſibility; of the truth of which we are aſſured by daily obſervation, when the hands or feet are benumbed, and almoſt entirely deſtitute of ſenſe by the ſeverity of froſt in winter-time, and in people otherwiſe well in health.

## SECT. DLXXVII.

HENCE it is evident, that the blood at that time ſtagnates in the ſmalleſt or extreme veſſels, and yet that at the ſame time there is a cauſe irritating the heart (§ 574.)

The two particulars remarked in this paragraph are the chief obſervable in this ſtage of the fever, and ought eſpecially to be taken notice of. For the blood and humours ſtagnate in the extreme veſſels, from the deficiency of thoſe cauſes which maintain them in motion during health. For, that the humours may have a free motion through the veſſels, three things are required; namely, for the magnitude of the humours to be tranſmitted to be ſuch as will allow them to paſs through the ultimate and ſmalleſt extremities of the arteries; and then, that the veſſels tranſmitting thoſe humours retain their due amplitude; and, laſtly, for the moving cauſes to propel the humours through the veſſels with a due force. But, in the cold fit of a fever, the veſſels are contracted and made narrower by the general effect of the cold, while, at the ſame time, the particles of the blood are united together, in the manner deſcribed before at § 117, and therefore, from both theſe cauſes, the free courſe of the blood through the extreme veſſels will be impeded; and this more eſpecially, as at the ſame time the moving power, namely, the contraction of the heart, loſes of its due force; and therefore it is ſufficiently evident that a ſtagnation muſt follow.

But at the ſame time this ſtagnation of the blood in the extreme parts of the body is accompanied with an irritation and more frequent contraction of the heart, the cauſe of which ſtill remains to be enquired after. It was ſaid before (§ 574.) that a quicker contraction of the heart aroſe from a quicker reciprocal influx of the nervous juice into the muſcles, and of blood into the veſſels and cavities of that organ. But ſince the other muſcles of the body ſhake and tremble from a too weak and unequal influx of blood and ſpirits into them, as was ſaid under the preceding aphoriſm; ſo the ſame effect ſeems to proceed from the ſame cauſes in the heart. But the veins being contracted during the febrile cold, drive their contained blood towards the right auricle and ventricle of the heart; and ſince it appears evident, from what was ſaid in the comment to § 574, that the motion of the heart may be renewed even after death, by urging the venal blood or flatus into the right ventricle; it is alſo equally evident, that this very powerful cauſe attends during the whole fit of the fever, whereby the heart is irritated into more frequent contractions. But ſince at the ſame time the influx of the nervous fluid and blood into the muſcles of the heart is languid and irregular, it will therefore be indeed contracted quicker by the irritation of the affluent venal blood, but then its action will be weaker, ſo that the heart will not be able to drive the blood with its uſual force, through the arteries, nor will it be able entirely to empty its ventricles, becauſe of the increaſed reſiſtances at the extremities of the arteries; and therefore the heart will very ſwiftly palpitate in the greateſt ſeverity of the cold fit of a fever, in order to ſupply the deficiency of its ſtrength, by oftener repeating its contractions. At this time, therefore, the pulſe will be extremely quick, but the circulation extremely weak, from a right underſtanding of which all thoſe particulars may be explained, which are obſerved in the cold fit of a fever, as will be ſaid under the following aphoriſm.

## SECT. DLXXVIII.

FROM hence (§ 577.) is underſtood the cauſe of all the circumſtances or phænomena (§ 575, 576.) then appearing.

For, the venal blood being derived to the right ſide of the heart, through the veins, contracted by the cold of the extremities, will therefore irritate the heart, whoſe left ventricle in the mean time not being able to overcome the increaſed reſiſtance at the extremities of the arteries, will therefore palpitate or contract quicker, but with leſs force than in health. But the left ſide of the heart, by an intervention of the wonderful organ, the cerebellum, does itſelf procure the cauſe of its own muſcular motion; for the action of the cerebellum upon the heart through the nerves, depends upon the action of the heart itſelf, by the arteries upon the cerebellum; ſince, therefore, the left ventricle of the heart then drives the blood with leſs force through the arteries of the cerebellum, this laſt muſt therefore act with leſs efficacy again upon the heart by the nerves. Indeed in other muſcles ſerving to voluntary motion, the application of this laſt cauſe, through the nerves, is made by the influence of the mind; but the muſcular motion of the heart is produced and deſtroyed alternately by the created fabric of the parts, without any previous determination of the mind. For no one living is able, by the ſtrongeſt endeavours of the will, either to increaſe or retard the motion of the heart. Beſides this, as the weaker contraction of the left ventricle makes a leſs dilatation of the aorta, that will again be contracted with leſs force, while the heart is dilating: but it is from this contraction of the aorta, that the blood is impelled through the coronary arteries and ſubſtance of the heart itſelf; whence it is evident, that the two cauſes of all muſcular motion, namely, the influx of arterial blood and nervous ſpirits are thus diminiſhed, and that thence muſt neceſſarily follow a weaker contraction of the heart; and yet that at the ſame time the irritation made by the venal blood urged towards the right ventricle may excite the heart to quicker contractions. Great anxiety or oppreſſion will therefore follow, from the free egreſs of the blood from the heart being impeded, as we ſhall hereafter demonſtrate at § 631. At the ſame time there is often great weakneſs, becauſe the free circulation of the humours through the encephalon is impeded, whence trembling, inſenſibility, &c. follow, as we enumerated and explained them before at § 576.

## SECT. DLXXIX.

IN every fever, after theſe ſymptoms have preceded (§ 575, 576, 577.) ariſes heat more or leſs, of longer or ſhorter duration, either internal, external, univerſal, or local, according to the different nature of the fever.

After the febrile cold, with all its appearances, has continued for ſome time, the powers of the heart gradually increaſe, and the reſiſtance about the ends of the arteries is diminiſhed; whence a heat, together with the blood, extends to the extreme parts of the body, the pulſation of the arteries becomes ſtronger and fuller, the paleneſs goes off, and the heart continues to be contracted, not only quicker, but it more powerfully propels its contained blood through the arteries, which are now leſs reſiſting; and ſince heat follows from an increaſed motion of the blood thro' the veſſels, (ſee the comment to § 100.) the febrile cold will be leſſening every moment, till the whole body recovers its natural heat, which, by the continuance of the ſame cauſes, is afterwards gradually increaſed. But this takes place in every fever, unleſs the patient ſhould be ſuffocated in the cold fit, which has been ſometimes obſerved. Even in intermitting fevers, if the patient is not very weak, or advanced in years, the hot fit is uſually ſo much the more intenſe, as the preceding cold was more violent.

Now, according to the different nature of the fever, this heat will vary in degree, duration, and place. The fever which is called an ephemera, and the ſimple continent have only a gentle heat and moiſture a little greater than what is natural; but a putrid continent has a much more intenſe heat, which in a manner pricks or offends the touch of the finger; (ſee § 731.) and in a true ardent fever, the heat is perceived burning to the touch, and the expired air itſelf ſcalding (ſee § 739.) Even in the plague, the violence of the diſeaſe being levelled againſt ſome certain parts of the body, burns them up into an eſchar like actual fire. In a true and exquiſite tertian, which never exceeds the ſpace of twelve hours, this heat continues but for a few hours: but in continual fevers, it is extended to ſeveral days, or even weeks; and in hectic fevers this heat often dries up and preys upon the body for ſeveral months.

It is one of the beſt ſigns if the febrile heat is equally diffuſed throughout the whole body, even to the extremities; for it denotes that the veſſels are pervious, and that the blood has a free courſe: But in the worſt fevers, which are then commonly fatal, there ſometimes happens an intenſe heat perceived about the vital organs, while, at the ſame time, the extreme parts of the body are cold; and it then denotes that the circulation is deficient in the extreme parts of the body, and that the impervious blood begins to be ſtagnated or accumulated about the vital viſcera; while, in the mean time, the heart being more ſwiftly contracted, propels the blood with a great velocity through the veſſels, which are yet pervious in the parts next adjacent.

But when in acute febrile diſeaſes the fever is accompanied with an inflammation in ſome particular part of the body, then the heat is obſerved greateſt in the part chiefly affected, although the reſt of the body is likewiſe violently heated: thus, in a true phrenzy, a great pain and heat is perceived in the head (ſee § 772;) in an inflammatory quinſy a moſt intenſe heat is ſeated in the fauces; and the ſame is alſo true in the other inflammatory diſeaſes. Hence Hippocrates [h] tells us, that by the greater heat the part affected may be diſcovered, where he ſays, *Quibus latus ſublatum in tumorem ac calidius eſt, & inclinatis in alterum gravitas aliqua impendere videtur, his pus ex una parte eſt.* "In thoſe who have a tumour and heat in "the ſide, and when they lie down there ſeems to "be the ſenſe of an impending weight on the "other ſide; in theſe there is matter contained "in the one ſide." And in another place [i], in order to determine the part which ought to be opened by inciſion or cauſtic in an empyema, he orders the thorax to be covered all round with a piece of thin linen dipped in a warm ſolution of red earth ground very fine, and where it appears to be dried firſt, he would have the inciſion or cauſtic applied.

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[h] Coac. Prænot. N°. 428. Charter. Tom VIII. pag. 877.

[i] De Morbis Lib. III. cap. 15. Charter. Tom. VII. pag. 593.

SECT.

## SECT. DLXXX.

WHICH heat (§ 579.) as it follows from the fever, already formed, is evidently more an effect thereof than the cauſe, nature, or eſſence of the fever.

It was ſaid before in the comments to § 560 and 570, that it was the opinion of Galen, and almoſt all the phyſicians after him, that the eſſence of a fever conſiſted in an increaſed heat. But it evidently appears, from what was ſaid before, that a true fever attends before there is an increaſed heat; and therefore the eſſence of a fever cannot conſiſt in heat, nor can heat be termed the cauſe of the fever, ſince it is altogether repugnant to reaſon, that a cauſe ſhould follow after its effect, which it muſt precede. Helmont, who endeavoured every way to ſubvert the opinions of the medical ſchools, which prevailed in his time, and often without reaſon, has nevertheleſs well obſerved here, that a fever cannot be defined a preternatural heat. For it is his opinion, that the fever is excited by life itſelf, in order to expel ſomething troubleſome or offenſive to the body, or at leaſt ſo to alter the matter that it may be no longer offenſive; and as inflammation, heat, pain, *&c.* are excited by a thorn in the fleſh until it is removed, the ſame he judged to take place in a fever; and therefore he has pleaſed himſelf with calling the cauſe, by whoſe ſtimulus life is excited to a greater motion, by the denomination of a thorn. Hence he pronounces [k], *Itaque febris non eſt nuda caloris tempeſtas : ſed adeſt occaſionalis vitiata materia, ad cujus*

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[k] De Febribus cap. 4. N° 20. pag. 751.

*cujus expulſionem Archeus per accidens ſe accendit, velut indignatus.* "Therefore the fever is not a "mere raging of heat, but there is ſome morbific or viciated matter as the cauſe; for the expulſion of which the archeus kindles itſelf by "accident as in a rage." But it is evident from the paſſage of Helmont, which we quoted in the comment to § 573, that by this name acheus, he would have us underſtand life itſelf. In another place he explains this opinion more at large in the following words[1]: *Nimirum cauſa peccans in febre non calet ex ſe: calefacit autem tantum occaſionaliter, & ad ſpinæ ſive cauſæ occaſionalis evulſionem ſequitur ſanitas. Solus ubique Archeus effective febrim concitat, & quo abeunte per mortem, ceſſat cum eo febris. Ergo calor eſt accidens poſterius, & ſubſequens ad febris eſſentiam. Accendit nimirum ſe ipſum Archeus in niſu, quo cuperet expellere materiam occaſionalem, tanquam ſibi impactam ſpinam. Hanc autem quicumque aufert, ſive id fiat per calida media, ſive per temperata, ſive demum per frigida, is morbum a radice tollit; & eſt naturæ quaſi indifferens, quia eo ipſo ſedatur ceſſatque thymoſis Archei, &c.* "That the cauſe offending in the fever does not "grow hot of itſelf, but is only an occaſional "cauſe of it, and that health follows after the "thorn, or occaſional cauſe is thrown out. But "the archeus only effectually raiſes the fever in "every part of the body, from whence departing "by death, the fever ceaſes together with itſelf. Heat is therefore an accident poſterior or "ſubſequent to the eſſence of the fever: for the "archeus employs all its forces in the endeavour "which it makes to expel the occaſional matter "as a thorn run into the fleſh. But whoever removes this thorn or matter, whether by medi-

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[1] De Febribus cap. 1. N°. 29. pag. 741.

"cines, heating, temperate, or cooling, he radically cures the diſeaſe; for nature is indifferent to either, becauſe by the removal of that cauſe only, the diſturbance of the archeus is quieted and ceaſes, *&c.*

## SECT. DLXXXI.

AND therefore a quicker contraction of the heart, with an increaſed reſiſtance at the capillary veſſels, completes the eſſence or idea of every acute fever.

An increaſed velocity of the pulſe is the pathognomonic ſign of every fever (as was ſaid before at § 571); which has for its proximate cauſe a quicker contraction of the heart, as was demonſtrated in the comment to § 573. But when this quicker contraction of the heart is joined with an increaſed reſiſtance at the capillary veſſels, that is, at the extremities of the arteries, we have then the idea of an acute fever, which is dangerous as well as ſwift in its progreſs, as was ſaid before at § 564. For when a healthy perſon runs ſwiftly for ſome minutes, the venal blood is derived with a greater celerity and impetus towards the right ſide of the heart, which is therefore obliged to contract more frequently, and thence a true fever enſues: but if ſuch a perſon does but reſt for a quarter of an hour, that motion of the blood will be quieted, and there will be no further ſign of a fever remaining; which fever therefore, as it terminates its courſe very quickly, but without danger, cannot in any wiſe be properly termed an acute fever. But when the ſame perſon has been running for a long time beyond his ſtrength, the moſt fluid parts of the blood being diſcharged in ſweats, and the reſt condenſed or compacted together by the violent action of the veſſels upon their contained humours, the blood at length becomes ſo impervious, that it can no longer run freely through the ſmalleſt capillary arteries; the reſiſtance of the heart will be therefore in this manner increaſed, whence a moſt acute fever may ariſe, which is often ſuddenly fatal, whereas before thoſe obſtacles, the quicker contraction of the heart would be quieted in a little time only by reſt of body. The ſame thing has frequently happened, when people being heated by violent exerciſe, immediately drink cold liquors, or imprudently expoſe themſelves to the cold air, whence they are deſtroyed by the moſt acute diſeaſes; for by the cold admitted, the veſſels are contracted, and the particles of the blood united together, after having been already too much diſpoſed to run into concretions, by the conſumption of the more fluid part in ſweats.

## SECT. DLXXXII.

BUT both theſe (§ 581.) may be produced in a living animal, by an infinite number and variety of cauſes, acting either ſeparately or conjunctly, and eaſily following in ſucceſſion the one from the other.

It is evident from what has hitherto been ſaid, that what we know concerning the nature of a fever by the apparent ſymptoms, may be reduced to very great ſimplicity, and that therefore we may very eaſily diſtinguiſh whether a fever is preſent or not, ſince there is an increaſed velocity

city of the pulſe throughout the whole time of every fever. But as there are an infinite number and variety of cauſes which may produce that quicker contraction of the heart, from whence the increaſed velocity of the pulſe ariſes, that ſimplicity no longer remains, but we often meet with greater difficulty both in diſcovering and diſtinguiſhing the remote cauſes, than in removing them. For it will hereafter appear, when we come to enumerate the principal cauſes of fevers in certain diſtinct claſſes, that the quickneſs of the heart's contraction may be increaſed by the various paſſions of the mind, by meat and drink, the different temperatures of the air, things externally applied, other diſeaſes going before, *&c.* but again the increaſed reſiſtance about the ſmalleſt extremities of the arteries may ariſe from very numerous cauſes; for all the cauſes of obſtruction, however numerous, either by default in the fluids, ſolids, or both together, may be hitherto referred.

But though both theſe immediate cauſes, namely, a quicker contraction of the heart, and a greater reſiſtance about the capillary arterial veſſels, may exiſt ſeparately in the body, yet either of theſe hardly continues long alone, but the one is eaſily followed by the other. For as is evident by what we ſaid in the comment to § 100, concerning the effect of the increaſed motion of the blood through the veſſels, this increaſed velocity cannot long ſubſiſt, but by the greater reaction of the veſſels upon the blood, and their violent compreſſion of the ſame, the more fluid parts will be expelled, whence a drineſs and inflammatory viſcoſity of the blood will ariſe, by which it will be rendered unfit to circulate freely thro' the narroweſt extremities of the arteries. On the other hand, if the reſiſtance about the capillary arteries is increaſed, the quickneſs of the contraction of the heart muſt alſo be ſoon increaſed. For in the comment to § 120 it was demonſtrated, that when a great number of veſſels is obſtructed, the velocity of the humours muſt be increaſed thro' the other pervious veſſels, which cannot happen, unleſs the velocity of the heart's motion is at the ſame time increaſed. For the velocity of the humours being in this caſe increaſed through the open veſſels, will drive the venal blood in a greater quantity and impetus to the cavities of the heart, and the blood will flow more ſwiftly and ſtrongly, through the coronary arteries into the ſubſtance of the heart, while at the ſame time the arterial blood will paſs more ſwiftly through the cerebellum; and therefore there will be a greater ſecretion of vital ſpirits, and a quicker motion of them through the nerves to the heart. From hence it is evident that the three cauſes (§ 574.) from whence the motion of the heart reſults, will be oftener applied in a given time to the heart, which will be therefore more frequently contracted.

## SECT. DLXXXIII.

THE proximate cauſe therefore of a fever (§ 581.) acknowledges an infinite number of cauſes for its proximate or immediate ones.

For whatever can increaſe any one or all of the cauſes which produce the contraction of the heart; as alſo all the cauſes, which give a greater reſiſtance to the humours moved by the force of the heart through the ultimate extremities of the arteries, may be proximate cauſes, with reſpect to thoſe which immediately produce the fever.

## SECT. DLXXXIV.

THESE cauſes are, however, divided into ſuch as are peculiar to every individual perſon, and ſuch as are univerſal or in common to moſt people, which are generally owing to their living with the ſame air, diet, and courſe of life.

But to obſerve order, among ſuch a numerous variety of remote cauſes of a fever, it will be moſt convenient to divide and ſubdivide them into certain claſſes, that we may the more certainly and eaſily find them out.

The firſt and moſt general diviſion of theſe cauſes is into thoſe peculiar to every individual perſon afflicted with a fever (and which may be therefore different almoſt in every one; as when, for example, one has a fever from a crapula or ſurfeit, another from overwatching, a third from too much exerciſe of body, *&c.*) or they are ſuch as are common to many people at the ſame time, as being generally ſeated in thoſe things, which cannot be avoided in the common uſes of life; thus the cauſe ſpreading a fever among many people living in the ſame place, frequently reſides in the air, the fever being accompanied with almoſt the like ſymptoms in every patient, and requiring the ſame method of cure, as will be hereafter explained more at large, when we come to treat profeſſedly of epidemical diſeaſes. Sometimes theſe univerſal cauſes of fevers reſiding in the air proceed from its manifeſt qualities of heat, cold, humidity, drineſs, *&c.* and ſometimes there is ſomething of an unknown matter applied, or taken into our bodies together with the air, which yet produces ſimilar effects among all, as in the plague, ſmall-pox, *&c.* Theſe common cauſes of fevers are likewiſe often owing to the diet or proviſions, as it frequently appears in beſieged cities, when hard neceſſity oppreſſes both the rich as well as the poor, and obliges all of them to uſe an ill diet, ſo that the like diſeaſes afflict them from a common cauſe. Thus a moſt ſevere peſtilence raged in Breda, when the beſieged inhabitants were obliged by extreme hunger to make uſe of an unhealthy diet [m]. Hippocrates [n] alſo remarks, that the uſe of ſtagnant waters of the fens in the winter time, excited peripneumonic and maniacal diſorders in young people, and ardent fevers in old people. But how the ſame courſe of life diſpoſes people to ſuffer the like diſeaſes, has been taught by Ramazini, in his Treatiſe of the Diſeaſes of Tradeſmen.

## SECT. DLXXXV.

THE cauſes therefore of a fever, are either particular or epidemic.

It was ſaid, in the comment to § 566, that Hippocrates diſtinguiſhed all fevers into two kinds; namely, according as they proceeded from a cauſe common to every one, or from the diet peculiar only to ſome. This general diviſion is therefore juſtly retained. Thoſe are properly termed epidemical cauſes of diſeaſes, which affect many inhabitants of the ſame country at one time, but which do not always predominate in that country. But ſince the epidemical cauſes of fevers are in this aphoriſm ſaid to be thoſe, which in the preceding one were called univerſal, and common to moſt people; it is therefore evident, that under this title are alſo underſtood the endemic cauſes of fevers, which not only prevail at certain ſeaſons, but alſo generally afflict the inhabitants of the ſame country, becauſe they derive their origin from ſuch permanent cauſes, as are peculiar to ſuch a country; thus, according to the different ſituations of cities, with reſpect to the courſe of the winds, Hippocrates [o] has obſerved them to be liable to epidemical diſeaſes. But the particular cauſes of fevers will be enumerated in the next paragraph.

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[m] Vander Mye de Morbis Bredanis, pag. 17.

[n] De Aëre locis & aquis. Charter. Tom VI. pag. 195.

## SECT. DLXXXVI.

THE more immediate particular cauſes (§ 583.) of fevers may be reduced to certain heads: as (1.) the ingeſta, or every thing acrimonious taken into the body, whether under the denomination of food, drink, ſauces, medicines or poiſons, having ſuch properties that they cannot be digeſted in, moved thro', or diſcharged out of the body; or when they are taken in ſuch a quantity, that they irritate, ſuffocate, obſtruct or putrify: (2.) the retenta, things retained within the body, which ought to be expelled, whether from cold, unctions, ſorrowful paſſions of the mind, meat, drink, medicines, poiſons, a damp foggy air, reſt, a neglect of wonted exerciſes, obſtructions and compreſſions, either from the contents of the veſſels themſelves, or from the ambient parts or bodies: (3.) the geſta, or actions either

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[o] De Aëre locis & aquis. Charter. Tom. VI. pag. 189, &c.

ther of mind or body, as too violent exerciſe, heat, &c. (4.) the applicata, or things externally applied to the body, being acrid, pungent, corroding, lacerating, burning or inflaming; (5.) ſuch things as produce great alterations in the humours and their motions, of which kind there are many, both external and internal, as hunger, evacuations, matter, water, ichor in ſuch as have a dropſy or empyema, ſharp ſerum collected in any part, exalted bile, an inflammation, ſuppuration, gangrene, cancer, over-watching, or want of ſleep, too intenſe ſtudy of any kind, exceſs of venery, &c.

Many of the cauſes here enumerated, do not excite a fever in all, but only, or at leaſt moſt frequently, in thoſe who are prediſpoſed; for, as we ſaid before, in the comment to § 11, the cauſes of diſeaſes are either prediſpoſing or occaſional. The firſt or proegumenal are ſo called, becauſe they prediſpoſe the body to diſeaſe upon the acceſſion of another cauſe, which would not have been of itſelf ſufficient to have produced the diſeaſe, without the aſſiſtance of thoſe prediſpoſing cauſes: as, for example, a difficult digeſtion of the aliments does not excite a fever in every one; for the ſtrong bowels of an huſbandman can diſpenſe with ſuch aliments, which would very much indiſpoſe a weak or tender perſon troubled with a relaxation of the ſtomach. Not every one who labours hard in the ſcorching heats of the ſummer, is thereby thrown into a fever, but thoſe chiefly are in danger of this, who are troubled with a plethora, or whoſe natural conſtitution inclines to heat. Hence Galen rather chuſes to call them occaſions than cauſes of diſeaſes, which only excite diſorders in bodies prediſpoſed; and, in treating of fevers, he obſerves [p]; *Quod nulla cauſa ſine corporis aptitudine agere poſſit: alioquin omnes, qui in ſole verſantur æſtivo, febricitarent; & qui plus æquo moventur, aut vinum bibunt, aut iraſcuntur, aut mærent,* &c. "That no cauſe can act "without an aptitude in the body; otherwiſe every "one who works in the ſummer ſun would have a "fever, and all thoſe who have exerciſed too much, "drank too much wine, or have given themſelves "over to anger or grief, *&c.*"

But that thoſe occaſional cauſes of fevers may be reduced to order, and better retained in the memory of the phyſician, it will be convenient to rank them under the five following claſſes, by running over which, he may find the one or more of them which have excited the fever he examines; that the cauſe being thus known, he may determine, agreeable to the rules of art, what method of cure, and what remedies may be required to remove it.

(1.) Ingeſta.] All the healthy humours in the body have ſcarce the leaſt acrimony, if we except only the excrementitious; namely, the urine and bile; for the blood of a healthy perſon excites not the leaſt pain to a naked wound, nor upon being dropped into the eye: hence all acrimony ſeems to be foreign to human nature, and every thing, which by too long retention in the body becomes acrid, departs from the reſt of the humours, and is diſcharged either by urine, ſtool, or inſenſible perſpiration; and therefore naturally all the humours are in health without acrimony. But then ſuch things as have a notable acrimony, may be received into the body from without. The firſt paſſages, as they are called, in

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[p] Galen. De Febrib. Lib. I. cap. 6. Charter. Tom. VII. pag. 112.

in the body, which receive, digeſt, and change the ſwallowed aliments, ſo that they may be afterwards converted into our own nature by the action of the veſſels and viſcera, do very often ſuſtain acrimony, which, if it was received into the blood, would immediately diſturb all the functions. Thus, even wine, ſpirit of wine, and even alcohol itſelf, are ſafely ſwallowed by many, and the moſt biting ſpices, ſalts, *&c.* are often taken without injury to the ſtomach or inteſtines. But when any quantity of thoſe acrid ingeſta enter by the lacteal veſſels, or abſorbing veins, into the ſtomach and inteſtines, ſo as to mix with the blood; the heart, which is ſo wonderfully irritable, may thereby be brought into quicker contractions, and the circulatory motion of the blood increaſed, as was demonſtrated in the comment to § 99. Indeed there is a faithful guard placed here to prevent the too crude or acrid ingeſta from eaſily entering the blood; namely, a contraction of the mouths of the abſorbing veins and lacteal veſſels by ſuch greater acrimony, which is by that means not eaſily admitted. But yet it cannot be denied, but part of the acrid ingeſta, mixing with the mild and diluting humours, may ſometimes inſinuate into the blood; for it appears, from the moſt certain obſervations, that the ſucking infant has been thrown into the worſt convulſions, by drinking in, together with the milk from the breaſt of a drunken nurſe, the acrimony of fermented liquors, intolerable to its tender body. The force of a purge taken by the nurſe, is often and with danger felt by the unhappy infant; and even the ſmell of garlic eaten may be perceived in the milk. From whence it is evident, that all paſſage is not entirely denied to acrid humours penetrating into the blood. Such a ſlight acrimony being received into the blood of a ſtrong and healthy perſon, may, by the action of the veſſels and viſcera, and by mixing with the mild humours, ſoon be overpowered, or elſe diſcharged from the body; but as long as that acrimony retains its nature in the blood, it may increaſe the velocity of its circulation by its ſtimulus. But theſe are taken into the body under the denomination of

Food or aliments, which are either already acrid at their eating, or become ſo in a little time, by ſtaying too long in the warm ſtomach. Thus milk in weak people frequently turns ſour, and the fleſh of animals, eſpecially thoſe of prey, living upon other animals, eaſily degenerates into a putrid acrimony. The livers of fiſh abounding with a ſoft oil, are ſoon converted into a rancid oily acrimony, and frequently excite a fever, or elſe cauſe a relapſe in thoſe who are recovering from that diſorder. But beſides this, aliments are ſometimes taken, which have already a great acrimony in themſelves, as old cheeſe, ſalted or dried fiſh and fleſh, rancid oils, *&c.*

Drinks.] Namely, when theſe are prepared by fermentation. For new ale, milk, whey, and the like, never offend by acrimony, unleſs they are already ſour, or become ſo in weak bodies. But that acrimony, which is inherent in fermented liquors, may, by a very wonderful and powerful ſtimulus, increaſe the quickneſs of the heart's motion; and hence it is that a moderate uſe of rich wine and ale proves ſo ſerviceable in languid and cold diſeaſes. But immoderate uſe of theſe liquors is too well known to excite fevers called ſurfeits; but theſe are ſlight, and are uſually deſpiſed by thoſe who are accuſtomed to have their veins filled with wine drank the day before. But it was obſerved from Hippocrates, in the comment to § 558, that extreme drunkenneſs is followed with a loſs of ſpeech, and ſometimes with a fatal apoplexy, unleſs a fever ariſing ſhould prove a remedy. The fourth and fifth patient, mentioned by Hippocrates in his third book of Epidemics [q], were both of them ill of a dangerous fever from drinking; and the firſt of theſe became deaf on the ſecond day of the diſeaſe, afterwards became delirious and raving, was convulſed on the fourth day, and died on the fifth: but the other recovered on the twentieth day after a ſevere diſeaſe: the ſon of a Grammarian being troubled with intenſe thirſt, and not finding any water, drank freely of old wine, and from that time continued watchful, but was afterwards taken with a fever, with watchings, and periſhed delirious [r].

Sauces.] They who live a frugal life with daily exerciſes of body, find hunger the beſt ſauce or ſeaſoning to their food; but thoſe who live in ſloth and idleneſs, or who have loſt their ſtrength of body by gluttony and drinking, are obliged to excite an appetite in their weak ſtomachs by theſe artificial incentives. All theſe are uſually made of the moſt acrid ſpices, pepper, garlic, onions, *&c.* with the addition of ſalt, vinegar, wine, and other things; in the compoſition of which an infinite variety is made out by a learned appetite or palate. All theſe, therefore, as they conſiſt of the ſtrongeſt ſtimulating ſubſtances, may increaſe the quickneſs of the heart's contraction, that is, they may excite a fever. It is an uſual remedy with the common people for a weak ſtomach to ſwallow whole grains of pepper; nor do they from thence receive much damage, inaſmuch as they are diſcharged whole as they were taken in, and but little altered: but I have ſeen a moſt ardent and dangerous fever raiſed in a perſon, who had ſwallowed a great quantity of beaten pepper; for this hotteſt of ſpices retains its ſtrength ſo firmly, that I have not been able to diſcharge it even by the eighth time of boiling in a great quantity of pure water, and therefore it continues to act by its ſtimulus as long as it is retained in the body. A very robuſt countryman, in the flower of his age, being a long time afflicted with a quartan, did, by the advice of a raſh mountebank, take a large quantity of ground muſtard in gin about three hours before the fit, but with the moſt fatal event; for his innocent quartan, which was grown much milder by the vernal warmth, was now converted into the moſt burning fever, which killed him in the ſpace of three days.

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[q] Charter. Tom. IX. pag. 232, 233.

[r] Galen. de locis affectis Lib. II. in fine Capitis ultimi. Charter. Tom. VII. p. 423.

Medicines.] In chronical and cold diſeaſes, as in a dropſy, palſy, and apoplexy of ſome kinds, *&c.* all the hopes of a cure are placed in exciting a fever, either ſpontaneouſly or by art, and then the hotteſt and moſt ſtimulating medicines are given with the greateſt ſucceſs. But ſometimes alſo purging and vomiting medicines do in their operation excite a very great diſturbance in the body, and too much increaſe the quickneſs of the circulation; though, in the mean time, the nature of the diſeaſe to be cured, requires the motion of the blood to be ſedate. Hence Sydenham [s] juſtly adviſes, that when a purge or vomit is neceſſary to be given in acute continual fevers, bleeding ought to be premiſed to prevent the too great agitation in the blood, which muſt ariſe from theſe medicines. And this he has inculcated the oftener, becauſe many phyſicians had eſpouſed an opinion that bleeding was pernicious, unleſs the primæ viæ were firſt cleanſed; namely, for fear the depleted veins ſhould attract the offending humours, as may be ſeen in Sennertus, Foreſtus, and others.

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[s] Epiſtola Reſponſ. prima pag. 395. & Sect. I. cap. 4. pag. 65. Et in Schedula Monitoria de novæ febris ingreſſu, pag. 677.

Poiſons.] Among poiſons there are ſome which exhibit a manifeſt acrimony to the ſenſes, as arſenic, corroſive ſublimate, *&c.* And it appears from manifold obſervations, that not only ſudden death, but alſo the moſt obſtinate and malignant fevers have been raiſed by taking of theſe poiſons. Among many remarkable inſtances which Wepfer [t] has collected concerning the bad effects of arſenic, there is alſo a caſe which confirms what is here advanced; *Puella enim, incautè devorato arſenico, toto die vomuit: neglecta per triennium morboſa ſupervixit, ac tabida ex febri, cujus indolem nemo agnoſcere potuit, obiit.* "For a girl having "unwarily ſwallowed ſome arſenic, vomited "the whole day; but ſhe being neglected ſur-"vived for three years, but periſhed tabid with "a fever, the nature of which no body could "diſcover." But there are other poiſons which by a wonderful force diſturb the whole body, excite the moſt acute fevers, and even death itſelf, altho' that cannot be reduced to any acrimony as yet known, which is contained in theſe ſo active poiſons, which even ſometimes ſeem mild to the ſenſes. Thus the viperine poiſon (as was ſaid in the commentary to § 155.) reſembles in colour and taſte oil of almonds. Who will pretend to determine the nature of the poiſon in the ſmall-pox, which makes ſuch havock, and alters the moſt healthy humours into the moſt malignant nature, though its ſubtlety eſcapes all our enquiry, and whoſe force is ſuch, that the leaſt drop of the variolous matter is able to affect another perſon in perfect health, as we are taught by inoculating the ſmall-pox. The ſame is alſo true in the plague and other contagious diſeaſes. In all theſe we know the cauſe of the fever by obſervation, and we ſee the effects; but the manner in which the cauſe applied to the body produces thoſe effects, is altogether concealed from us.

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[t] Cicutæ aquat. hiſtoria pag. 281.

Having ſuch properties that they cannot be digeſted in, moved through, or diſcharged out of the body.] What we take in are ſaid to be digeſted, when they are ſo changed by the actions of the veſſels and viſcera, and by mixing with the humours of the body, that they become like thoſe humours, and at the ſame time ſuch parts as are not thus altered, and which cannot be overcome by the digeſtive powers, are in due time, and by the uſual paſſages, diſcharged out of the body. It is therefore neceſſary, in order for what is taken into the body to be digeſted, that the alterative or concoctive powers prevail over the ſtrength and coheſion of what is taken in: there may be therefore a two-fold cauſe impeding this digeſtion or attenuation, namely, a weakneſs of the aſſimilating powers, and too great a coheſion or tenacity of the ſubſtances taken into the body, both which cauſes may either happen ſeparately, or concur together at the ſame time. The hardy ploughman not only eats beef and bacon, which have been ſalted and dried in the ſmoak, without any detriment, but he is thereby well nouriſhed; whereas a weak girl would be oppreſſed and made feveriſh with ſuch aliments. It is therefore required, as Galen well ſays, in a paſſage we before cited in the comment to § 25. *Ut concoquendum familiarem habuerit naturam reſpectu coquentis: tunc enim corpore ſecundum naturam ſe habente mutatio & alteratio totius ſubſtantiæ coquendi fit, aut maximæ ejus partis, &c.* " For the nature of the

" food to be concocted to have a proper affinity " with reſpect to the ſtomach that is to digeſt it, " which will cauſe a due change or alteration " throughout the whole ſubſtance, or at leaſt the " greateſt part of what is to be digeſted." But it appears, from daily obſervation, that when food of difficult digeſtion is taken into the body, or even too great a quantity of food in its own nature eaſy of digeſtion, the perſon becomes indiſpoſed, grows hot, thirſty, and at the ſame time there is an increaſed quickneſs of the pulſe, that is to ſay, a true fever attends, by which the efficacy of the veſſels upon the humours being increaſed, thoſe parts may be divided, which otherwiſe could not by the natural and ſedate motion of the humours. There is no body but has experienced this at ſome time or other in themſelves. Such ſlight fevers ariſing in healthy people from ſmall errors of diet, and laſting but for a few hours, are eaſily removed; but even from this cauſe only in the weaker ſort of people, a very intenſe fever is ſometimes kindled, and the daily taking in ſuch food of difficult digeſtion, will often excite fevers of the moſt ſtubborn kind. Galen [u], with two young men, his companions, being in the country, at a great diſtance from the city, and finding no proviſions, the ſharpneſs of his appetite made him eat plentifully of boiled wheat, only ſeaſoned with ſalt; but he ſoon after perceived a weight in his ſtomach, and the next day loathed all food, was troubled with flatulencies, his head ached, and his eyes looked red, nor yet did he diſcharge any thing by ſtool. His companions were likewiſe all troubled with the like complaints. For the crude wheat not being fermented, was ſo glutinous and tenacious, that it could not be digeſted in, moved through, and diſcharged from ſuch juvenile bodies. And even the ruſtics confeſſed, that when they are through neceſſity obliged to live upon this food, they find it heavy and difficult of digeſtion. Thus we often ſee infants, whoſe parents, preſſed with poverty, being obliged to feed them daily with crude farinaceous food, not well fermented, their abdomen appears ſwelled and ſtuffed up with ſuch undigeſtible food; they are coſtive, and waſte with a ſlow continual fever, till at length they are carried off with a diarrhæa and dyſentery.

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[u] De Alimentor. Facultat. Lib. I. cap. 7. Charter. Tom. VI. pag. 314.

When people have been obliged to uſe ſuch an ill courſe of diet in beſieged cities, the worſt diſeaſes have followed, as we ſaid before in the comment to § 584; for ſuch food does not only create diſorders in the primæ viæ, but the crude chyle from thence prepared, renders the blood viſcid and impervious, and therefore by increaſing the reſiſtance or obſtructions about the ſmalleſt extremities of the arteries, it may create a fever, as is evident from what was ſaid before at § 581, 582.

Or taken in ſuch a quantity that they irritate, ſuffocate, obſtruct, or putrefy.] For the ingeſted aliments may not only offend in their qualities, but alſo by the immoderate quantity which oppreſſes the ſtomach, and cannot be digeſted by the powers of the chylificative viſcera. Hence, frequently children who have been admitted to great feaſts or entertainments, are troubled with a fever, until their ſtomach is freed from the troubleſome load either by vomiting or a diarrhæa. The variety and mixture of aliments, is likewiſe frequently the cauſe of the like maladies, the appetite being invited to load the ſtomach beyond its natural capacity,

city, by the agreeable taſte and variety of the meats. Strong bodies uſing exerciſe, are hardly affected with great errors in diet; but people who are naturally inclined to weakneſs, or ſuch as are recovering after diſeaſes, are ſeverely puniſhed even for ſlight errors in diet, while their weak viſcera are not capable of digeſting a great quantity of food. Hence Hippocrates ſays [w], *Hæc eſt autem ciborum offerendorum occaſio, ut ea copia exhibeantur, quam corpus ſuperare valet.* "But the "call for foods to be adminiſtered is this, to exhi-"bit them in ſuch a quantity that they may be "overcome by the body." And in another place he ſays [x], *Ubi nutrimentum præter naturam copioſius ingreſſum fuerit, id morbum facit.* "Where the "nouriſhment is taken in greater quantity than "nature can bear, it occaſions diſeaſe." In thoſe afflicted with a pulmonary conſumption, it is ſufficiently evident, that too great a quantity even of the moſt ſalutary food, proves immediately hurtful, and rouſes up a fever, or at leaſt augments the fever that already attends. For if ſuch take a large quantity of milk at once, immediately the ſlow fever, which continually preys upon them, is increaſed with great anxiety; but when they take it in ſmall quantities at different times, they find it agrees very well.

For when a greater quantity of the food is taken than the body can bear even in healthy people, they are oppreſſed and troubled with loathings and ſickneſs, till at length the ſtomach being irritated by the load, frees itſelf by vomit. It is a very dangerous diſorder when the ſtomach is extremely diſtended by too great a quantity of aliments rarefied by heat and ſtagnation; for then both orifices of the ſtomach have been obſerved to contract themſelves violently with a convulſive force, whence has followed intolerable anxiety, fruitleſs endeavours to vomit; and laſtly, a fatal apoplexy, while the trunk of the deſcending aorta, being preſſed by the diſtended ſtomach, urges blood too forcibly and in too great a quantity upon the encephalon, ſo that the veſſels being extremely turgid, are ſometimes burſt. Add to this, that the aliments thus retained in the ſtomach and inteſtines in too great a quantity to be digeſted by the chylificative viſcera, follow their own inclination to corrupt in the ſame manner as they would be changed ſpontaneouſly by ſtanding in a warm and moiſt place, whence the moſt malignant putrefaction or depravity often enſues, more eſpecially if the ingeſted food naturally inclines to putrefaction, as fleſh, fiſh, eggs, *&c.* The truth of this is demonſtrated by the vomiting of corrupt matter, and the moſt fetid diarrheas which ſo frequently follow after feaſting and gluttony.

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[w] De Locis in homine cap. 15. Charter. Tom. VII. pag. 374.

[x] Aphor. 17. Sect. II. Charter. Tom. IX. pag. 54.

2.] We know, for certain, that the ſolid and fluid parts of the body are ſo altered by the motion of the humours and veſſels, which is neceſſary to life and health, that they become unfit for thoſe offices which muſt be ſuſtained to continue life and health: but theſe vitiated parts are naturally expelled from the body, while at the ſame time others are prepared from the aliments by the efficacy of the veſſels and viſcera inſtead of thoſe expelled. This excretion therefore of the parts, which by a too long retention have become offenſive, is equally neceſſary as the taking in food itſelf to ſupply the waſte thus made. Nor is this true only of thoſe excretions which are naturally made every day, but alſo of ſuch as more ſeldom happen, or which are only obſerved in diſeaſes. Thus frequently do fevers ariſe from a retention of the menſes, and from a ſuppreſſion of the lochial diſcharges in lying-in women; and in thoſe people who have had iſſues a long time in any part, or ulcers for ſome years, which daily diſcharge a conſiderable quantity of matter, it is often obſerved, that by ſuddenly healing them up, ſuch are not only invaded with fevers, but alſo the moſt dangerous diſeaſes. In the moiſt kind of herpes in infants, where there is a conſiderable quantity of humours diſcharged every day through the ſkin and cuticle, in this caſe wonderfully altered, if that diſcharge is ſuddenly ſuppreſſed without ſubſtituting other evacuations, they are immediately indiſpoſed, and often killed by that means.

Thoſe parts, which by too long a retention in the body become offenſive, are in a ſtate of health diſcharged chiefly by ſtool, urine, and perſpiration; for though there are other excretions obſerved in the body, yet they ſerve not ſo much to depurate the maſs of humours, as for the ſingular uſes of particular parts; as for example, the mucus of the noſe, the ear-wax, *&c.* for the tender ſurfaces of the olfactory membranes are firſt moiſtened and defended by this mucus, which, after becoming thick and dry, is evacuated or blown out. But theſe three evacuations, namely, by ſtool, urine, and perſpiration, diſcharge ſuch parts as according to the laws of health can be no longer retained within the body; and therefore theſe are the uſual highways, one of which being obſtructed, increaſes either of the reſt, and ſo that each may ſupply the place of the other. Hence Hippocrates [y] tells us, *Cutis raritas, alvi denſitas.* "That "a copious perſpiration denotes a conſtipation

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[y] Epidem. VI. Charter. Tom. IX. pag. 433.

"of the bowels." And in another place [z], *Quod mictio noctu copioſa facta paucam dejectionem (per alvum) ſignificet.* "That a plentiful diſcharge by "urine in the night, denotes a ſmall evacuation "by ſtool." It appears, from daily obſervation, that the quantity of the urine is increaſed when the perſpiration is diminiſhed, and the reverſe. Thus a perſon who ſweats with hard labour in the ſummer-heats makes very little urine, though he takes in great plenty of drink. But although a defect in any of theſe excretions may be ſupplied by increaſing the reſt, yet the integrity of all is neceſſary to continue health: for each of theſe emunctories diſcharge ſome parts which cannot be evacuated by the reſt, as the celebrated Gorter [a] prudently obſerves in his moſt accompliſhed and elaborate treatiſe of perſpiration. The matter therefore retained in the body by the obſtruction of theſe emunctories, through which they ought naturally to be diſcharged, may create diſeaſes, and particularly fevers. The urine retained in the bladder, becoming more acrimonious by ſtagnation and warmth of the parts, may, by diſtending and eroding the bladder, excite an inflammation and fever attended with the worſt ſymptoms, as we are aſſured from numerous inſtances in the writers of medical obſervations. When the urine is not ſeparated from the blood through ſome defect of the kidneys, or when after its ſeparation, the paſſage through the ureters into the bladder is obſtructed by a calculus, or any other cauſe, thoſe acrid parts being retained, which uſed daily to be evacuated in the urine, will excite a fever, and will ſooner or later bring on certain death, but uſually

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[z] Sect. IV. Aphor. ultimo. Charter. Tom. IX. pag. 191.
[a] Cap. 11. § 34. pag. 100.

ally affecting the brain firſt. A ſuppreſſion of the inteſtinal diſcharge is indeed tolerable much longer, yet it is not without danger; and Hippocrates [b], long ago, tells us, a fever is to be thence feared; for he ſays, *Dejectiones alvi procedere oportet his, qui laboribus exercentur; quamdiu parum ederint, ac parum potaverint, paucas & duras; ſi vero tertio quoque die aut quarto, aut ex longiori intervallo prodierint, periculum eſt, aut febre, aut alvi profluvio corripiendos eſſe.* "That in thoſe exerciſed with "labour, the evacuation by ſtool ought to be "ſmall and hard, ſo long as they eat ſparingly "and drink little; but if they are diſcharged only "every third or fourth day, or at longer intervals, "there is danger of their being taken with a fever or diarrhœa."

But thoſe two excretions made by urine and ſtool are not continually performed from the body, and the parts which ought to be expelled by theſe emunctories, are collected together in the cavity of the bladder, and the whole tract of the large inteſtines, by which means we may continue longer without theſe evacuations, and without any great detriment to our health. But the perſpiration with which we are at this day acquainted, can never be interrupted and a ſtate of health remain, although it is obſerved more plentiful at one time than at another; and therefore it is no wonder that the moſt frequent indiſpoſitions ariſe in our bodies, from an impediment of this excretion and thoſe cauſes which we have already conſidered under this aphoriſm, have a principal relation to this excretion.

That the whole body is perſpirable was indeed known to the ancient phyſicians; but that the perſpiration only exceeds all the other evacuations taken together, and that a juſt proportion of this diſcharge is of the laſt moment, as well for the preſervation of health as the cure of diſeaſes, was firſt taught us and found out with great labour by Sanctorius, whoſe doctrine has been afterwards confirmed by Keil; and the diſcoveries of both theſe have again been collected, confirmed and improved by the celebrated Gorter, who has added moſt uſeful obſervations of his own, and has by a tedious courſe of experiments, diſcovered how far the aphoriſms of Sanctorius, which he had formed from his obſervations in the air of Italy, are agreeable to thoſe who inhabit our more northern climate. From the moſt faithful obſervations made by theſe authors, the reaſon will appear why the following are juſtly ranked among the cauſes of fevers.

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[b] Prædiction. Lib. II. Cap. 4. Charter. Tom. VIII. pag 813.

Cold.] It was ſaid before, in the comment to § 117, that the particles of our humours unite together by cold; and that the orifices of the ſmalleſt veſſels opening in the ſurface of the ſkin, may be contracted by cold, no one can in the leaſt doubt; and therefore both theſe effects of cold conſpiring together, may obſtruct the perſpiration. Hence it is that the cold, eſpecially admitted to the body while warm in bed, ſo often proves injurious by leſſening the perſpiration; and that a frequent agitation of the body in bed, while the ſummer heats are diſagreeable, is by Sanctorius reckoned one of the moſt frequent cauſes of an obſtructed perſpiration, which is alſo confirmed by Keil and Gorter. From the obſervations made by the forementioned authors, we have the following general rule, "that the perſpira-"tion is leſs at that time, when the thermometer "in-

"indicates a greater cold[c]." But cold is above all the moſt prejudicial, when it ſuddenly follows after great heat; for thence often ariſe fatal pleuriſies, when the body heated by labour is expoſed to the cold air. Hence it is that Sanctorius carefully adviſes us in many places to avoid this pleaſing, but deceitful cooling of the body. For the ſame reaſon alſo the diſeaſes of autumn rage moſt when the cold mornings affect thoſe unwary people, who being impatient of the heat at noon neglect to defend their bodies with ſufficient cloathing. This admonition has been given us by Celſus[d], where he ſays, *Per autumnum vero, propter cœli varietatem, periculum maximum eſt. Itaque neque ſine veſte, neque ſine calceamentis prodire oportet,* &c. "But during autumn there is the greateſt "danger, becauſe of the variation of the weather; "and therefore one ought to go abroad neither "without good cloathing nor without good ſhoes."

Unctions.] It is highly probable that fat ſubſtances obſtruct thoſe ſmall canals thro' which the thinneſt humours perſpire, ſince it appears from experiment that thoſe humours are watery: And for this reaſon in ſome people a ſlight anointing of the ſkin even with the mildeſt oil, excites an eryſipelas, and often a fever. But theſe unctions ſeem to have been often uſed to leſſen too great a waſte in the humours this way. Unctions were uſed after warm bathing, that the moiſture acquired in the bath might not be diſſipated, and the bodies of the athletæ were alſo anointed to prevent ſweating in exceſs, after which duſt was ſprinkled over them, that the limbs made ſlippery with the oil might be more firmly held by the wreſtlers[e]; from whence it appears that unction with fat ſubſtances ſtops, or at leaſt leſſens the excretion which is made thro' the ſkin. But whether or no this is always of ſuch bad conſequence as to raiſe a fever, may be juſtly doubted, ſince this practice was familiar among the antients after bathing, and was uſed without any bad conſequence by the very ſtrong athletæ. The incomparable Reaumur [f] found a method of prolonging the lives of inſects by leſſening their perſpiration; and it is not without reaſon he believes the ſame thing may be tried in the human ſpecies: For in the cold countries, where people perſpire leſs, we find more of the long livers than in the warm countries; and in winter, when the perſpiration is much leſs, we ſee people live as well in health as in ſummer. Even though it cannot be denied, that many diſeaſes ariſe from an obſtructed perſpiration; yet it has not been hitherto determined what quantity of perſpiration is neceſſary to be made in every perſon to maintain health, ſince the other evacuations may help a diminiſhed perſpiration. It is probable that by being over careful to defend the body from the injuries of the air, we increaſe this perſpiration beyond what is abſolutely neceſſary. For we ſee plainly that people go almoſt naked [g] as well in the hotteſt as in the coldeſt regions without any detriment; nor are they poſſibly troubled with any greater heat or cold than ourſelves, as the whole body is in them hardened like unto the hands and face in us, which without injury we expoſe even to the ſevereſt cold. And how much cuſtom may do in this caſe we are taught from tender girls, who expoſe many parts of their body to the air without injury, which could

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[c] De Gorter de Perſpirat. cap. 12. § 34. pag. 129.

[d] Lib I. cap. 3. pag. 33.

[e] Mercur. De Arte Gymnaſt. Lib. I. cap. 8. pag. 36, 37.

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[f] Memoir. pour l'Hiſtoire des Inſect. Tom. II. pag. 48, &c.

[g] Idem Tom. III. pref. pag. 1, 2.

could not be done even by the moſt hardy ploughman unaccuſtomed thereto.

Since therefore it is always dangerous to leſſen ſuddenly the wonted perſpiration, yet this might poſſibly be done by degrees without damage. Sudden alterations from heat to cold have been obſerved prejudicial by phyſicians in all ages; whereas people without injury bear the gradual changes of the ſeaſons of the year, which are by degrees altered from the ſummer heats to the moſt ſevere winter's cold. Even an increaſed perſpiration ſeems to weaken; and on the contrary a leſſening of it ſtrengthens the body. Thus we are all faint in very hot weather, and cannot perform the uſual exerciſes without uneaſineſs, whereas in ſharp cold weather the body ſeems light and active. It is evident that many people live perfectly in health, who perſpire much leſs than ourſelves. The moſt brutal race of men, the Hottentots who inhabit about the Cape of Good-Hope, do certainly leſſen the perſpiration by ſmearing their bodies all over with a mixture of ſoot and oil; and other nations in general cover the body quite over with a coloured varniſh or paint. Travellers tell us [h] that in Perſia they varniſh over the bodies of camels with pitch in the ſpring time when they ſhed their hair, that they may by that means be defended from the biting of flies. From all theſe inſtances therefore it is evident, that the inſenſible perſpiration may be much diminiſhed without detriment to health; and that it would ſeem to be a means of ſtrengthening the body to reduce this diſcharge to a leſs quantity. Thoſe who have been accuſtomed to ſuſtain the injuries of the air from their youth, with only a ſlight covering to their bodies, lead a life healthy and ſtrong; and on the other hand, thoſe who have had their bodies too carefully defended from the cold, inſtantly perceive even ſlight alterations of the air, and are indiſpoſed by the leaſt uncovering of the body. I have viſited many women, who being accuſtomed to load their heads with many coverings, have been violently afflicted with the head-ach, tooth-ach, *&c.* but by gradually expoſing the head more and more to cold, and by waſhing every morning with cold water, they have afterwards lived free from thoſe complaints. Perhaps this may be the reaſon why Hippocrates[i] ſays, *Qui probè perſpirant imbecilliores, & ſalubriores exiſtunt, & facilè convaleſcunt. Qui malè perſpirant, priuſquam ægrotent, robuſtiores ſunt. Quum vero in morbum inciderunt difficilius ſanantur. Hæc autem & toti & parti*— "That they who perſpire plentifully are weaker, "more healthy, and eaſily recover. That they "who perſpire little become ſtronger before they "are ill; but that when they labour under a diſ"eaſe, they are more difficultly cured. But the "former more eaſily and perfectly recover." For ſo long as the perſpiration is regularly carried on in people of a weak habit, they uſually find themſelves in perfect health; and as indeed the perſpiration is apt to be obſtructed in ſuch people from very ſlight cauſes, yet it is eaſily reſtored, and ſuch people more readily recover. But they who perſpire leſs are generally more robuſt and conſequently are not liable to be indiſpoſed from ſuch ſlight cauſes; but when the natural ſtrength of ſuch people is overcome by the more violent cauſes of diſeaſes, their illneſs is more dangerous, and their recovery more difficult. And

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[h] Idem Tom. II. pag. 53.

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[i] De Alimento. Charter. Tom. VI. pag. 287.

hence in another place he obſerves; [k] *Corpora exercitata ac denſa citius a pleuriticis & peripneumonicis morbis pereant, quam non exercitata.* "That "ſtrong and exerciſed bodies ſooner periſh by "pleuritic and peripneumonic diſeaſes, than ſuch "as are not uſed to labour or exerciſe."

Sorrowful paſſions of the mind.] This is obſerved by Sanctorius in ſeveral places of his ſtatical aphoriſms; and, on the contrary, that nothing more promotes a free perſpiration than chearfulneſs of mind [l]. But he has moreover not only taught us that grief and fear obſtruct the perſpiration, but that the perſpiration being once impeded from any cauſe, is followed with grief and fearfulneſs of mind. This is alſo confirmed by thoſe ſigns in a perſon ſuddenly ſtruck with fear, or affected with extreme grief; for ſuch turn pale, grow cold, and are contracted throughout the whole body, the pulſe is weak, and in fear it beats quick, but in thoſe oppreſſed with extreme grief it is uſually ſlow. Since therefore the powers, which ought to apply the humours to the ſecretory and excretory organs, are thus weakened, and at the ſame time all the ſigns denote that the ſmalleſt veſſels of the ſkin are contracted in theſe affections, ſo as to reſiſt more powerfully the humours to be expelled, it is ſufficiently evident that the ſecretion and excretion of the perſpirable matter muſt be leſſened, or at leaſt ſometimes wholly intercepted for a ſhort time; hence follows a return of the humours inward, attended with that ſevere anxiety or oppreſſion of which the patient then complains, as if a great weight or preſs was acting upon the præcordia.

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[k] Coac. Prænot. No. 398. Charter. Tom. VIII. pag. 875.

[l] Vide No. 457, 458, 459, 460, &c.

Meat, drink.] In what manner meat and drink endowed with a great acrimony, as alſo things indigeſtible, and food taken in too great a quantity, may create a fever, has been explained a little before. But Sanctorius obſerves that the inſenſible perſpiration is very much leſſened by ſome certain meats or drinks. Pork, muſhrooms, melons, and new raiſins or figs, &c. he obſerved greatly diminiſhed the perſpiration [m]; and the ſame he alſo remarks with regard to drinks [n].

Medicines.] Thoſe of the milder kind indeed which hardly produce any diſturbance in the body do not leſſen perſpiration, as Sanctorius [o] obſerved of Caſſia; but thoſe which make a powerful evacuation, leſſen the perſpiration, as he obſerves [p].

Poiſons.] For theſe much more powerfully diſturb the body than medicines, and at the ſame time weaken the vital powers.

A damp foggy air.] Sometimes we obſerve ſuch fogs as adhere to the walls and marble pavements, where being condenſed they run down in ſtreaks like oil; and ſometimes at an unuſual ſeaſon of the year this is accompanied with great heat, and then all people complain of a ſenſe of heavineſs and wearineſs, which are the moſt certain ſigns of a diminiſhed perſpiration. Many people at that time alſo become peripneumonic, the perſpiration of the lungs being checked by ſuch an air. Sanctorius calls ſuch an air foul or foggy, and juſtly remarks its effects, when he ſays [q], *In cœnoſo prohibetur perſpiratio; meatus implentur, ſed non denſantur; fibræ laxantur, non roborantur, & pondus perſpirabilis retenti lædit, & ſentitur.*

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[m] Sanctor. Aphor. 224, 225, 226, 228, 246. [n] Aphor. 266, 267, 268, 269. [o] Aphor. 48. [p] Aphor. 48, 53, 54, 57. [q] Aphor. 147, 148.

"In a foggy air perſpiration is leſſened, the pores "are obſtructed but not contracted, the fibres are "relaxed not ſtrengthened, and the weight of "the retained perſpirable matter is both ſenſible, "and injurious to the body." But that the perſpiration is alſo leſſened by a cold air, is obſerved to us by the ſame author; but then the weight of the perſpirable matter retained is neither ſenſible nor injurious, becauſe the pores are then contracted, and the fibres ſtrengthened But this foul or foggy air is generally accompanied with a ſoutherly wind, which is confirmed by the obſervations of Hippocrates, who ſays, [r] *Auſtri vero corpora exſolvunt, & humectant, gravitatem capitis, auditum gravem, & vertigines faciunt in oculis, & in corporibus difficultatem ad motum, & alvos humectant.* "But the "ſouth winds relax and moiſten the bodies of peo-"ple, bring colds in the head, difficulty of hear-"ing, giddineſs in the ſight, and in the reſt "of the body an indiſpoſition to motion, with a "diarrhœa." But he obſerves that the contrary of all theſe happen when the north wind blows.

Reſt, or a neglect of wonted exerciſes.] How much exerciſe conduces to preſerve health and ſtrengthen the body, was ſaid before in the comment to § 25. N°. 2. and § 28. N°. 2 and it there appeared, that the digeſtion and aſſimilation of the aliments into healthy humours were thus promoted, namely, by increaſing the motion of the ſolids and fluids: But from the ſame cauſes proceed the excretions of thoſe parts which would be injurious if any longer retained in the body; and therefore reſt of body, or a neglect of wonted exerciſes, not only impedes the ultimate attenuation of the aliments, but alſo retards the expulſion of ſuch parts as ought naturally to be diſcharged from the body, in order to maintain health. When a ſenſe of wearineſs is perceived after ſleep, which is a ſign of a diminiſhed perſpiration, that complaint is removed by ſuch things as facilitate that inſenſible diſcharge, as Sanctorius [s] informs us, among which he reckons exerciſe: For by exerciſe he obſerves that the body becomes lighter, and the perſpirable matter is prepared to be exhaled [t]. But on the contrary, long reſt renders ſickly bodies heavier, becauſe the meat and drink are not digeſted, and the excrementitious perſpirable matter is not prepared to be diſcharged, from whence all manner of diſeaſes, and often death itſelf follow as conſequences [u]. Even when perſpiration is deficient in healthy people, he tells us it is reſtored by exerciſe [w]. Hence Galen would not have even old people abſtain from exerciſes, but orders them to keep up to their accuſtomed labours, only to leſſen the violence of them [x]. *Ignavia corpus hebetat, labor firmat, illa maturam ſenectutem, hic longam adoleſcentiam reddit* [y] "Becauſe idleneſs renders "the body dull, but labour ſtrengthens it; the "firſt brings on old age betimes, but the laſt oc-"caſions a long youthfulneſs."

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[r] Aphor. 17. Sect. III. & Aphor. 5. Charter. Tom. IX, pag. 95, & 111.

Obſtructions and compreſſions either from the contents of the veſſels themſelves, or from ambient bodies.] For ſince obſtruction ſuppoſes (according to § 107.) an exceſs of bulk in the particles to be tranſmitted above the capacity of the tranſmitting veſſels, it is very apparent that the excretory ducts being obſtructed, thoſe parts will be retained which ought to be evacuated. But among the cauſes of obſtruction (§ 112.) we reckoned thoſe which by an external compreſſure diminiſhed the capacity of the veſſels, which muſt therefore have a place here. The paſſages for the urine and inteſtinal fæces which are ſo open, if compared with the ſmalleſt perſpiring veſſels, may yet be totally intercepted by tumours formed in the adjacent parts, as appears from the hiſtories of diſeaſes; and therefore it is no wonder if the perſpiring veſſels are compreſſed by ambient bodies endeavouring to take up a larger compaſs When in ardent fevers the blood by an inflammatory tenacity ſtagnates impervious in the ſmalleſt arteries, theſe laſt being diſtended compreſs the adjacent ſecretory and excretory ſmall ducts, and hence the whole external ſkin, tongue, internal parts of the mouth, fauces, *&c.* are invaded with a burning heat; and when the patient recovers from theſe dangerous diſeaſes, almoſt the firſt time of nature's overcoming the diſeaſe is a return of moiſture into all theſe parts.

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[s] Aphor. 374.

[t] Aphor. 386.

[u] Aphor. 389.

[w] Aphor. 411.

[x] De Sanitate tuenda Lib. V. cap. 3. Charter. Tom. VI. pag. 144.

[y] Celſ. Lib. I. cap. 1. pag. 20.

3.] What great diſturbances may ariſe in the body from great commotions of the mind (was ſaid before in the comment to § 99. and § 104.) where they appeared to be a very powerful cauſe accelerating the circulation, which ſuppoſes a more frequent contraction of the heart, and conſequently implies a fever (§ 573.) For even in the moſt healthy perſon a great affront offered, ſhall not only excite moſt ſevere anger, but alſo a fever, ſo that only changing the thoughts or ideas may diſturb the whole body. Galen [z] well obſerves in ſpeaking of the affections of the mind, *Quod in*

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[z] Method. med. Lib. XII. cap. 5. Charter. Tom. X. pag. 283.

*in illis omnibus ipſa per ſe ipſam moveatur anima.* "That in all thoſe paſſions the mind itſelf is "moved and affected by itſelf." For there is nothing corporeal capable of exciting ſuch turbulent motions, ſince even the recollection of an injury formerly received, is able to renew thoſe tumults which had been long ago quieted. But too much commotion of mind is more hurtful than too much motion of body, as Sanctorius [a] well obſerves, becauſe the motion of the body may be allayed by ſleep and reſt, while that of the mind cannot.

But alſo violent motion of body long continued, eſpecially in thoſe unaccuſtomed to it, may excite fevers, and thoſe even of the worſt kind. In the comment to § 571. it was ſaid that the venal blood was by muſcular motion carried with a greater force and celerity towards the right ſide of the heart, which was by that means irritated into a quicker contraction, whence a true fever enſued, but ſoon vaniſhed again if the cauſe was not violent; but ſometimes this fever continues ſo long as to be of pernicious conſequence, the truth of which is confirmed by many inſtances in the writers of obſervations. It may be ſufficient for us to produce one inſtance of this from Hippocrates [b]. A young man lay ill of a fever in the Forum Mendeſium from laſſitudes, labour, and running beyond what he was uſed to, of which he periſhed on the ſeventh day: And here on the firſt day the urine was thin and dark coloured, the bowels diſturbed, attended with watchings, and on the ſecond day with a diſturbance of the mind; but on the third day there was great anxiety, and the extremities of the body were cold and livid. From which hiſtory it is evident that an acute and fatal fever may ariſe only from exceſs in motion of the body, and that even accompanied from the beginning with the very worſt ſymptoms.

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[a] Aphor. 494, 496. [b] Hippoc. Epidem. 3: ægroto octavo. Charter. Tom. IX. pag. 242.

Heat, *&c.*] Sultry heat of the air makes one of the moſt frequent cauſes of fevers, as appears from daily obſervation; for the moſt fluid parts of the blood being exhaled, the reſt acquire an inflammatory denſity and tenacity, whereby its motion will be more reſiſted thro' the capillary arteries: But from this reſiſtance readily follows a quicker contraction of the heart, that is a fever, as we demonſtrated before in the comment to § 582. The very worſt of fevers rage when the extreme heat of the air are accompanied with violent exerciſes of the body. Thus frequently being in the heat of the ſun occaſions a fatal frenzy, as we ſhall declare hereafter at § 772. Therefore Hippocrates [c] juſtly ranks among diſeaſes of the ſummer continual and ardent fevers; with many tertians and quartans.

4.] In ſearching after the cauſes of fevers, we ought to attend to ſuch things alſo as are externally applied to the body; for frequently the worſt conſequences ariſe from thence which are in vain ſought after from other cauſes. A thorn fixed in ſome part of the body, eſpecially ſuch as is tendinous, has frequently excited a violent inflammation together with a fever. Cantharides applied to ſeveral parts of the body at one time, have thus alſo frequently produced a fever accompanied with extreme thirſt, a ſtrangury and bloody urine; on which account they are often ſo ſerviceable in languid and cold diſeaſes. When an unfortunate girl anointed her head with butter mixed with arſenic, the moſt ſevere pains enſued, and the head was in vain waſhed with water; for there enſued watchings, a ſwelling of the whole head, fainting fits, a ſlight fever, delirium, &c. and on the ſixth day ſhe expired[d]. What frightful maladies ending in a miſerable death have enſued, when ignorant mountebanks have ſprinkled a large quantity of corroſive ſublimate on a plaſter, and applied it to ſome external tumour which they would have break, may be ſeen in Degnerus[e]. There are many more ſuch obſervations which confirm the ſame thing; but theſe may ſuffice to prove, that a fever may enſue from the external application of acrid ſubſtances.

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[c] Aphor. 21. Sect. III. Charter. Tom. IX. pag. 116.

5.] The blood (as was ſaid before at § 92, and the following) has ſome certain qualities by which it is diſtinguiſhed from other known fluids; and it was likewiſe made evident in the comment to § 97, that the created fabric of the body formed blood in animals, which could not be imitated by any art hitherto known, nor do I believe it ever will be poſſible to make this imitation. But this ſanguificative power is poſſeſſed not only by perfect animals; but alſo the tender growing ſtamen of the incipient chick does, in the firſt day of incubation in the egg, aſſiſted by the heat of the ſitting hen, form red blood out of the albumen, of which there was not before the leaſt appearance. So long as the blood is moved through the veſſels poſſeſſed of all its neceſſary qualities, the animal is in health; but ſo ſoon as it degenerates from its natural ſtate, either by a mixture with foreign particles, or through ſome defect of the veſſels and viſcera, all the functions will be diſturbed, and a fever produced from the too quick action of the heart irritated by a vitiated blood. Thus in the moſt healthy people, after taking a more than uſual quantity of food, there is obſerved a manifeſt acceleration of the pulſe, as long as a great quantity of crude chyle flows thro' the veſſels mixed with the blood; and hence weak people immediately are ſenſible of the leaſt error in diet. When the blood ſo greatly degenerates from its natural craſis in the pale virgin, that fever is produced which phyſicians uſually call white; becauſe in theſe tender bodies the blood cannot be digeſted to its laſt degree of perfection; ſo that inſtead of good blood a foreign humour flows through the veſſels.

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[d] Wepfer. Cicut. Aquat. Hiſt. & noxæ, cap. 21. pag. 289.

[e] Hiſtoria Medica de Dyſenteria bilioſa contagioſa, &c. pag. 234.

But for blood to be formed of the indigeſted aliments, requires a due motion of the humours through the veſſels; and the firſt appearance of red blood in the hatching egg appears in that point where there is a pulſation manifeſtly perceived; ſee the comment to § 97. and thus the chyle prepared from the indigeſted aliments circulates with the blood for many hours through the veſſels, before it acquires the nature of that fluid. Every thing therefore which greatly alters this motion of the humours, may diſturb the ſanguification or converſion of them into blood, and cauſe them to degenerate more or leſs from their natural healthy ſtate.

But very great is the number of thoſe cauſes which may greatly alter the motion and nature of the humours, and ſome of them are ſo ſubtle as to appear only by their effects, and others which are no ways diſcoverable by the ſenſes; as for example, the virus of the ſmall-pox, plague, *&c.* we ſhall therefore enumerate the principal of theſe cauſes, (for to reckon up all of them would be difficult)

difficult) that by the knowledge of them one may be able to judge of the reſt.

Hunger.] It was ſaid before at § 80. that after the aliments have been reduced by the power of the body into ſuch liquors as are uſually found in healthy and robuſt people, they ſpontaneouſly incline to putrefaction, as well from reſt as by too violent motion, after a perſon has abſtained from all meat and drink for the ſpace of twenty hours. Then it is that the ſenſation which we call hunger ariſes in a healthy perſon, to give notice that the body requires freſh aliment to reſtore thoſe parts which have been deſtroyed by the actions of life and health. But when hunger has been ſuſtained for a long time, the blood is not molified with ſweet chyle prepared from the aliments, but all the humours become acrid and inclined to putrefaction, the breath then begins to ſtink, the urine becomes very ſharp, and a fever with thirſt ariſes from the increaſed acrimony of the blood and all the humours. This is evident in thoſe who have had the æſophagus gradually ſtreightened by a ſcirrhous tumour or ſome ſuch other cauſe, till at length the paſſage into the ſtomach has been totally intercepted; concerning which lamentable diſorder we ſhall treat more at large in the hiſtory of a quinſy; for ſuch unfortunate patients are at laſt killed with hunger, the paſſage of all ſolid and fluid aliments being intercepted, are attended with a fever, and all the ſigns of the humours tending to putrefaction.

But how long hunger may be ſuſtained without being deſtructive to life, has not as yet been accurately determined; Hippocrates [f] has told us, *Si quis velit ſeptem diebus nihil comedere vel bibere, plurimi in his (diebus) moriuntur; quod ſi qui illos ſuperaverint, tamen moriuntur, licet poſtea comedere &*

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[f] De Carnibus cap. 8. Charter. Tom. V. pag. 309.

*& bibere perſuadeantur.* "That if any attempt to "faſt for ſeven days without eating or drinking, "moſt of them die within that time; but that "even thoſe who ſurvive it do nevertheleſs die, "altho' they are afterwards perſuaded to eat and "drink." But we read in the ſacred ſcripture, that out of 276 people who faſted without food for the ſpace of fourteen days, for fear of a ſhipwreck, not one of them periſhed [g]. An Engliſh woman is recorded to have lived only by the ſmell, without meat and drink, for the ſpace of an entire year, tho' kept under a perpetual guard by order of King Henry the eighth [h]; and we are likewiſe told of a Scotchman living thus for ſeveral months. Many more ſuch hiſtories are related by [i] Schenckius and the other writers of obſervations.

Evacuations.] It was ſaid in the comment to § 25. that a due aſſimilation of the aliments required a large quantity of healthy humours preſent in the body, into which is poured only a ſmall quantity of crude chyle prepared from the aliments; and that this is a law of nature we are taught from phyſiology. For the food taken into the ſtomach and inteſtines, there mixes with a large quantity of ſaliva, pancreatic juice, juice of the ſtomach, *&c.* and the chyle thence made is again diluted with a large quantity of lymph in the receptaculum chyli, and then it is mixed ſlowly or in a ſmall quantity with the blood flowing through the ſubclavian vein. And hence again when too great a quantity of crude chyle is mixed with the blood of people who have taken too large a meal, a fever is thereby produced, as we obſerved a little before. If now the quantity of our healthy innate humours is diminiſhed by too large evacuations, the proportion of the crude chyle will be too great with reſpect to the concocted ed healthy humours, whence the ſame effect will follow as before mentioned. Hence we frequently obſerve great weakneſs of body with an ill ſtate of the juices after profuſe hæmorrhages, from miſcarriages, wounds, &c.

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[g] Acta Apoſtol. cap. 27.

[h] Joh. Cajus De Ephem. Britan. pag. 131.

[i] Lib. III. pag. 321.

But when the humours ſeparated from the blood, and thinner than the blood itſelf are too plentifully diſcharged out of the body, the reſt of the maſs is more diſpoſed to run into concretions, by being deprived of what is moſt fluid, from whence may follow an inflammation which is always accompanied with a fever. Hence when the moſt fluid parts of the humours have been exhaled by the ſummer heats, autumnal fevers and inflammatory diſeaſes are obſerved to be the moſt numerous and obſtinate.

Matter.] It was obſerved in the comment to § 406. that when the beſt laudable pus or matter remains long confined in a cloſe and warm place, it is by degrees attenuated, and changes into a worſe nature, becoming ichorous and acrid; and that then being very eaſily abſorbed by the mouths of the veins, it infects the whole maſs of blood with a purulent cacochymy, which is always accompanied with a ſlow fever. This we are aſſured of by the hectic fever, which is continually waſting thoſe who have an ulcer in the lungs, and which is never curable, unleſs the ulcerated part can be cleanſed and healed; and this is true in whatever internal part of the body the ulcer or abſceſs may be ſeated. For a phthiſis or conſumption may as well ariſe from an ulcer in the kidney, as in the lungs. Hence Hippocrates ranks a fever among the ſigns of an empyema, as we ſhall declare hereafter.

Even when the whole ſkin abounds with matter in the ſmall-pox, that being abſorbed kindles a fever of the worſt kind, which is often ſuddenly fatal, unleſs the matter is expelled from the body either ſpontaneouſly or by art, or elſe by a tranſlation of it upon ſuch parts as will allow the collected matter a ſafe exit to be procured.

Water or ichor in ſuch as have a dropſy or an empyema.] An incipient dropſy does indeed often follow from fevers of long continuance, but is ſeldom or never of itſelf with a fever; for all the parts in this diſorder are cold and languid. But an inveterate dropſy is uſually accompanied with a fever, becauſe the waters at length by ſtanding begin to corrupt and putrefy, part of which being abſorbed and mixed with the blood, by its ſtimulus excites a fever, and greatly increaſes the thirſt. Moreover, as almoſt all the lymph eſcapes from the veſſels in a dropſy, and is collected in the larger or ſmaller cavities of the body, the reſiſtance of the blood, being thus deprived of its more fluid parts, is increaſed about the capillary veſſels, while at the ſame time the heart is ſtimulated into quicker contractions by the putrid acrimony abſorbed, whence a moſt ardent fever may be excited in this moſt cold diſorder. Thus the legs of dropſical people which were at firſt cold as marble, become afterwards ſo violently hot and inflamed, when the ſtagnant waters begin to corrupt, that frequently a gangrene of the worſt kind enſues.

Sharp ſerum collected in any part.] It is frequently obſerved in ſcorbutick people that the legs break out with very painful ulcers, diſcharging a great quantity of acrid ſerum corroding the adjacent ſkin. If ſuch ulcers are ſuddenly healed up by drying medicines, without firſt correcting the ill ſtate of the humours, fevers and the worſt conſequences may follow. The ſame is alſo apparent in thoſe who have been ſubject to diſcharge humours every day in iſſues; for the ſudden drying up of thoſe emiſſaries are attended with the like ill conſequences. In the puncture of a nerve or tendon, there is uſually a thin liquor collected about the wound, which ſometimes not being able to eſcape through a ſmall opening, ſpreads itſelf through all the adjacent panniculus adipoſus, and in a little time acquires a malignant acrimony, whence ariſe the worſt inflammations, ſinuous ulcers, gangrenes, *&c.* which are then always accompanied with a fever. When the ſkin is eroded in infants by an acrid ſerum, eſpecially in the head, it is dried up into thick ſcabs, under which the collected ichor corrupts in a little time, as is evident from the ſtinking ſmell, and makes deep eroſions; and this acrid matter being abſorbed, often creates malignant fevers, convulſions and death itſelf. I keep by me the parietal bones of an infant almoſt entirely eat through by this diſorder, and which bones altho' they were cleanſed, afforded the ſame ſtinking ſmell for ſeveral months, which had been before obſerved intolerable to every one, in the living infant.

Exalted bile.] When by any cauſe the bile, which is of all the natural humours of the body in its own nature the moſt acrid, is rendered ſtill more acrimonious, it is then ſaid to be exalted, becauſe it excites ſuch diſturbances in the body, and frequently proves the cauſe of the moſt ardent fevers. That the bile is exalted by the ſummer heats, we are taught by conſtant obſervations from Hippocrates even to the preſent time, whence after very hot ſummers, autumnal bilious fevers are always found very common. But unleſs the corrupt bile is evacuated either ſpontaneouſly or by art in the beginning of theſe fevers, they uſually hold the patient very long, and towards the end of the diſeaſe a diarrhæa or dyſentery is excited by the putrid bile; which diſcharge the patient's ſtrength being already extenuated by the preceding diſeaſe, he is often not able to ſupport, as we ſhall hereafter explain more at large, when we come to treat of vomitings in fevers. Hippocrates[k] tells us that the body becomes more bilious by the ſummer heats[l], and that the bile put in motion is the cauſe of an ardent fever, and in ſeveral other places he ſays that the bile is the cauſe of moſt acute diſeaſes. Accordingly I have known many people who have been once a month ſubject to a ſevere head-ach and fever, which having continued ſome hours they have diſcharged a great quantity of bile by vomiting, and have immediately found themſelves well. A purge given once or twice in a month to evacuate this bile as ſoon as it begins to be collected, and before it is exalted, removes theſe complaints.

Inflammation.] This is evident from what was ſaid in the comment to § 558.

Suppuration.] For this follows a preceding inflammation, and during the time while the ſuppuration is made, all the inflammatory ſymptoms are increaſed, as was obſerved at § 387. for a fever accompanies every inflammation, and will be therefore increaſed by a ſuppuration; whence Hippocrates obſerves to us, that the pains and fever happen more remarkably about the time of the formation of matter, than after the pus is formed; ſee the comment to § 158. N°. 6. But even after an inflamed part has been converted into a ripe abſceſs, the matter being too long confined, attenuated and rendered acrimonious, may again produce a fever by returning into the blood, as we obſerved a little before.

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[k] De Salubri victus ratione textu 15. Charter. Tom. VI. pag. 228. [l] De Affectionibus cap. 3. Charter. Tom. VII. pag. 622.

Gangrene.] For this is uſually the conſequence of a moſt violent inflammation; and a ſuppuration alſo follows in the margin of the inflamed part, while thoſe parts corrupted by a gangrene, are ſeparated from the adjacent living parts; to which add, that the gangrenous or corrupt matter being abſorbed, often excites a very putrid fever.

Cancer.] From the immenſe pain, inflammation of the adjacent, and return of the very acrid ſanies or foul matter into the blood, concerning which we treated before in the comment to § 499.

Overwatchings or want of ſleep.] For by this means there is a great waſte made of the moſt ſubtle humour in the body, which cannot be repaired but by ſleep. Hence, after a perſon has been awake too long, all the functions of the body are weakened, and the concocting powers, by which the crude aliments ought to be changed into our own nature, are depraved, which gives riſe to a train of the very worſt diſeaſes. Sanctorius[m] obſerves to us, *Somno ſolito breviore ſemper aliquid perſpirationis prohiberi: quod niſi ſequentibus diebus pleniore perſpiratione compenſetur, imminet febris periculum.* "That the ſleep being ſhorter than "uſual, always hinders ſomething of the perſpira-"tion, which, if not removed by a more copious "perſpiration in the following days, will be in dan-"ger of exciting a fever." And in ſeveral other places he reckons up the ill effects of over-watching. But ſince the inſenſible perſpiration is obſtructed by keeping too long awake, and ſince we have largely demonſtrated under the preſent aphoriſm, that fevers very frequently riſe from that obſtruction, it is therefore evident, that overwatching is deſerv-

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[m] Aphor. 336.

edly ranked among the cauſes of fevers. Hippocrates [n] with his accuſtomed brevity tells us, *Somnus, vigilia, utraque modum ſi exceſſerint, malum.* "That ſleep and vigilance are both of them injurious in exceſs."

Too intenſe ſtudy upon any thing.] This has almoſt the ſame effect with over-watching; for thus the moſt ſubtle parts of the blood are too much diſſipated and conſumed, whence a wearineſs and heavineſs of the whole body follows, and often a greater weakneſs than after violent exerciſe of body: and this more eſpecially happens while the mind is employed with all its thoughts fixed upon only one object, like as we read of Archimedes [o], "Who in the midſt of all the tumult "that could be raiſed in a captive city by the "rapacious ſoldiers, continued ſo intent upon his "figures which he had deſcribed in the duſt, "that he was killed by a Soldier, igno"rant who he was." *Qui in tanto tumultu, quantum capta urbs in diſcurſu diripientium militum ciere poterat, intentus formis, quas in pulvere deſcripſerat, ab ignaro milite quis eſſet, interfectus fuit.* Therefore ſtudy with a variation of the paſſions of the mind may be longer ſupported, as Sanctorius [p] tells us, than when there is no variation or change of the objects and paſſions. *Hinc antiquiſſimis temporibus medendi ſcientia ſapientiæ pars habebatur, ut & morborum curatio, & rerum naturæ contemplatio ſub iiſdem auctoribus nata ſit: ſcilicet his hanc maxime requirentibus, qui corporum ſuorum robora inquieta cogitatione, nocturnaque vigilia minuerant* [q]. *Literarum enim diſciplina majori ſtudio agitata, ut animo præcipue om-*

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[n] Sect. II. Aphor. 3. Charter. Tom. IX. pag. 45. [o] Titi Livii Lib. XXV. cap. 31. [p] Aphor. 499, 500. [q] Celſus Præfat. pag. 2.

*omnium neceſſaria, ſic corpori inimica eſt* [r]. “Hence “in the moſt antient times, the knowledge “of medicine was eſteemed a part of philoſo-“phy, and the cure of diſeaſes, and the know-“ledge of natural things were firſt conſidered “or treated of by the ſame authors; namely, be-“cauſe thoſe who ſtudied nature, by weakening “their bodies with reſtleſs thoughts, and noctur-“nal contemplations, ſtood much in need of the “aſſiſtances of medicine. For the ſtudy of the “learned ſciences, as they are attained with great-“er attention, and are more eſpecially neceſſary “for the accompliſhment of the mind, ſo are “they more inimical to the body, as Celſus ob-“ſerves to us.” Thus is there no ſtate on all ſides happy; for of all men thoſe who give themſelves up to the ſtudy of wiſdom might live the moſt happy, if they were not obnoxious to diſeaſes from the ſame cauſe. Happy are they who can ſo conduct their life, as to join the healthy exerciſes of body together with the improvements of mind.

Exceſs of venery.] How great an alteration is made in the body of the male, at the time when the ſemen begins to be formed and collected, appears from common obſervation; for the riſe and continuance of the beard and cloathing of the pubes depends thereupon, and a wonderful alteration appears both in the voice and paſſions of the mind; for the hitherto crying boy now becomes extremely bold, and often deſpiſes even real dangers. Nor is this obſerved only in mankind, but other animals alſo become extremely fierce about the ſame time. Even ſo great is the alteration of body at that time, that Hippocrates [s] expects the cure of the moſt difficult diſeaſes from puberty. No wonder therefore if the body is ſo much diſturbed by exceſs of venery. The bull, a moſt fierce animal, when he ſets upon the venereal act becomes afterwards languid: and thoſe unhappy people, who have exhauſted the vigour of the body by too early and immoderate venery, live enervated and ſubject to diſeaſes: for a ſeldom uſe of this raiſes the faculties of the body, but too frequent depreſſes them, as Celſus [t] tells us. But he determines this frequently, not by number, but from the nature, age and habit of the body, and ſays, that it has not damaged the body when it is neither followed with weakneſs nor pain. Sanctorius [u] obſerves, that the inſenſible perſpiration is diminiſhed, and the concoctive faculties weakened by exceſs of venery; and in ſeveral aphoriſms which follow after, he reckons up the damages proceeding thence. It is therefore no wonder fevers, and thoſe of the worſt kind, ſhould ariſe from the ſame cauſe. Hippocrates [w] gives us an account of two patients in fevers from drinking and exceſs of venery; one of which eſcaped not without difficulty, after a ſevere diſeaſe, extending to the twenty-fourth day, and the other expired at the ſame time of the diſeaſe. But in another place [x] he relates more at large, the many diſorders which are uſed to follow exceſs of venery, where he treats of a tabes dorſalis; in deſcribing which diſeaſe he ſays, *Tabes dorſalis a medulla (ſpinali) oritur, maxime autem recens nuptos & libidinoſos concipit.*

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[r] Celſus Præfat. pag. 2.

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[s] Aphor. 7. Sect. 5. Charter. Tom. IX. pag. 197.

[t] Lib. I. cap. 1.

[u] Aphor. 415, 416.

[w] Epidem. 3. Ægroto X. & XVI. Charter. Tom. IX. pag. 304, & 310.

[x] Hippocrat. De Morbis Lib. II. cap. 19. Charter. Tom. VII. pag. 571.

*cipit. Sine febre ſunt, bene comedunt, & contabeſcunt. Quod ſi ita affectum perconteris, dicit, ſibi videri ex ſuperioribus partibus a capite velut formicas ſecundum ſpinam deſcendere; quumque urinam aut alvum reddit, prodit ipſi ſemen copioſum & liquidum, neque genitura intus concipitur, & in ſomnis, cum uxore dormiat, nec ne, ſemen profundit; quumque tum alias, tum præcipue per locum arduum iter fecerit, aut cucurrerit, anhelatio & debilitas ipſum prehendit, & capitis gravitas, & aures ſonant. Hic temporis progreſſu vehementibus febribus correptus perit ex lipyria febre.* “That the tabes dorſalis ariſes from the medulla ſpinalis, and moſtly happens to thoſe who are over leacherous or lately married. They are without fever, and eat heartily, but waſte away. But if you aſk him how he is affected, he anſwers, that there ſeems to him as if ants were creeping down the ſpine from the top of the head; a great quantity of liquid ſemen itſelf is alſo diſcharged when he goes to urine and ſtool, nor does he retain the ſemen in his ſleep, but loſes it whether he ſleeps with his wife or not. And when he travels or runs, eſpecially through mountainous or difficult places, he is taken with great weakneſs and ſhortneſs of breath, a heavineſs in the head, and a tinkling in the ears. Such a patient in proceſs of time, being taken with a violent fever, periſhes with a lipiria, wherein the internal parts burn with heat, and the external are cold.” All theſe complaints have I ſeen, and many more in theſe miſerable patients who have indulged themſelves with foul pollutions. I have obſerved wonderful pains wandering throughout the whole body, attended ſometimes with troubleſome heat, and ſometimes with chillineſs, and eſpecially in the loins, which complaint continued for three whole years inflexible to all remedies in a young man from the cauſe here mentioned.

After the pains above were leſſened, he felt ſo great a coldneſs in his thighs and legs, that he was obliged to ſit by the fire-ſide even in the midſt of ſummer, though to the touch his body ſeemed to have the natural warmth. But what ſeemed moſt wonderful to me was, that during this time, the teſticles were always moving and whirling about in the ſcrotum, and that the patient ſhould perceive the ſame motion in his loins with a great ſenſe of uneaſineſs.

We have now enumerated, and for the ſake of method reduced into diſtinct claſſes, thoſe cauſes which are obſerved to excite a fever: it now remains for us to conſider thoſe changes which happen in the human body from the fever itſelf, and which are termed the effects of the fever, ſince they follow from thence as the cauſe: concerning theſe therefore we ſhall treat in the aphoriſm next following.

## SECT. DLXXXVII.

THE effects of a fever are a quicker propulſion and expulſion of the humours, an agitation of thoſe which ſtagnate, an intimate mixture of them altogether, an attenuation of thoſe which reſiſt the vital powers, a concoction, ſecretion of the matter concocted, a criſis, or a critical diſcharge of that which by a ſtimulus or coagulating force produced the fever; add to theſe an alteration in the humours from their healthy to a diſeaſed ſtate, or elſe the introduction of ſuch a change in the nature of the healthy ſolids and fluids, as will enable the patient to ſuſtain things to which he has not been accuſtomed; and laſtly, there follows an expulſion of the more fluid parts of the humours, and a thickening of thoſe which remain; to which add, thirſt, heat, pain, anxiety, weakneſs, wearineſs, heavineſs, oppreſſion and loathings, or averſion to food.

We now ſee what a fever is able to effect in the human body, ſo far as we conſider it abſtractly; for hitherto we have been only treating of a fever in general, ſuppoſing a healthy perſon to be taken with it. The firſt effect then will be.

A quicker propulſion and expulſion of the humours.] It is evident by what was ſaid before at § 573, that a quicker contraction of the heart attends in every fever; but the heart cannot be more ſwiftly contracted, without expelling the blood contained in its cavities with a greater velocity, nor without propelling the ſame with a greater celerity through the arteries. For if the reſiſtances in the arteries are ſo great as to prevent the blood from being thrown into them, the motion of the heart ceaſes, and death is preſent: but every fever not only ſuppoſes life preſent, but alſo is itſelf an affection of life endeavouring to avert death, as we demonſtrated in the comment to § 573. In the cold fit of a fever indeed the blood often ſtagnates in the extremities of the veſſels, (ſee § 577.) but even then the celerity of the blood's motion expelled from the heart, is increaſed through the larger veſſels about the heart itſelf: for though in the cold fit the heart only expels a ſmall quantity of blood in each contraction, yet as it palpitates very ſwiftly, it moves what was expelled with a greater celerity.

An agitation of thoſe which ſtagnate.] Some humours always ſtagnate even in health, in ſeveral parts of the body; and there are ſeveral uſes which require a collection and improvement of certain humours ſeparated from the blood into certain cells or cavities. Thus the cyſtic bile ſtagnates in a receptacle proper to itſelf, and the marrow is collected in the bones of quieſcent animals, and the thick fat is collected in the adipoſe membrane, where it ſtagnates almoſt without motion; alſo in the mucous cryptæ of the ſtomach and inteſtines, there ſtagnates a thick humour, *&c.* But beſides theſe diſeaſes, there are often many humours collected and ſtagnant in the cavities of the body, which were before in motion. Thus the cavities of the abdomen, thorax, brain, pericardium, *&c.* in the living animal, are repleniſhed with ſubtle vapours, which are every moment expelled from the ſmalleſt arterial ducts, and in the ſame proportion drank up again by the mouths of the abſorbing veins opening into the ſame cavities: but when the animal is in a languiſhing condition, theſe vapours, being condenſed and collected together, appear in the form of ſtagnant water, as we are taught by dropſies. But when the motion of the humours is increaſed by a fever, thoſe which in health ſtagnated, are likewiſe put in motion, as appears from daily obſervations in practice. A fat perſon recovering after an acute continual fever, often loſes half his weight, and the ſkin hangs looſe in unſightly wrinkles on the abdomen, which but fourteen days before ſtood out to the diſtance of half a foot with fat. Hence Galen[y] recommending violent exerciſes and heating medicines for the cure of corpulency, admoniſhes the phyſician to take notice that the patient thus treated will probably be ſeized with a fever, which yet will rather forward the intention, if every thing is rightly conducted. It is too well known with what diſturbance the bile is often expelled both upward and downward in fevers; and frequently there are bilious vomits in every fit of a tertian; nor is this all, but the ſame bile, which ſtagnating before in its cyſt, only diſtilled ſlowly into the duodenum, being now attenuated and exalted by the fever returning into the blood, tinges the urine and eyes of the patient, almoſt as in a jaundice. In the cure of a dropſy, phyſicians of all ages have made uſe of ſuch medicines as are capable of exciting a fever in a healthy body, and this with a view to render the ſtagnant ſerum moveable, and to diſcharge it from the body. The antients made uſe of the boldeſt doſes of hellebore, elaterium, ſpurge, *&c.* and the ſharpeſt purgatives and vomits of the like nature are uſed as liberally by the moderns, the uſe of all which is ever accompanied or followed with a fever. The ſharpeſt ſpices, pepper, garlic, ginger, *&c.* are again recommended for the ſame purpoſe by others; all which are ſtill adapted to excite a fever, as is evident from what was ſaid at § 586. N° 1. The moſt tenacious atrabiliary feculences of the blood, which have lain ſometimes for many years together without motion, are ſometimes diſſolved and put into motion by violent fevers, ſo as to produce the moſt dreadful maladies, as we ſhall declare more at large, at § 1104. The incorrigible matter of a ſcirrhus which has lain dormant for ſome years by reſt of body, is often put into ſuch a commotion by a fever ariſing from any cauſe, as to degenerate in a little time into a malignant cancer. From all theſe inſtances it is ſufficiently apparent that an agitation or commotion of ſtagnant humours is here deſervedly ranked among the effects of a fever.

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[y] Method. Med. Lib. XIV. cap. 15. Charter. Tom. X. pag. 335, 336.

A mixture of them altogether.] For thoſe humours which before ſtagnated, were ſeparated and collected apart from the reſt in the common Circulation. But when theſe, being moved by a fever, are abſorbed by the veins and mixed with the blood, they paſs on through the veins to the right ventricle of the heart, and from thence thro' the ſmalleſt extremities of the pulmonary arteries, they are conveyed by the veins to the left ventricle, by which they are again drove forward through the aorta. But it appears from phyſiology (or the ſtructure and action of the parts explained in our Theoretical Lectures[z]) that each particle of the blood drove from the heart into an incurvated artery, is every moment of time acquiring a different direction, colliſion, rotation, *&c.* from whence muſt neceſſarily follow the moſt perfect mixture poſſible. Hence appears the reaſon why when ſo great a quantity of fat is mixed with the blood in a ſhort time, while a corpulent perſon lies ill of a fever, it is all diſcharged from the body without any appearance, or at leaſt very rarely, of real fat to be perceived in the diſcharged humours; the urine indeed appears very red, but the fat being intimately mixed with the ſalts, rendered more acrimonious by the fever, is reduced into a ſaponaceous nature, and the inteſtinal fæces alſo are extremely fætid, but never afford the appearances of real fat.

An attenuation of thoſe which reſiſt.] This effect of a fever is of the greateſt importance, and from a neglect therein great errors are often committed in practice. For in ſuch a manner is the machine of our body framed by the adorable Creator, that when any thing is applied, either as a ſtimulus or obſtacle, to diſturb the equable circulation of the humours, then either a new motion is excited in the body, or that already ſubſiſting is increaſed. When too great a quantity of crude chyle is mixed with the blood from taking too great a meal, there is always a ſlight fever obſerved two or three hours after; and the ſame thing happens when the food is too difficult to digeſt, as we obſerved under the preceding aphoriſm. For ſince it is by the reciprocal action of the veſſels upon the contained humours, and of the humours upon their containing veſſels, that the chyle prepared from the food and mixed with the blood is gradually changed, ſo as to depoſit its own nature and become blood; therefore the velocity of the motion of the humours through the veſſels is thus increaſed, that the changing cauſes may be oftener and more powerfully applied in the ſame time to the greater quantity of more crude chyle, in order to make an attenuation of that which reſiſts. When the blood ſtagnates in the extremities of the veſſels during the cold fit of an intermitting fever, the reſiſting matter is attenuated or removed in that caſe by the fever itſelf, whereupon the fit terminates, and the equability of the circulation is reſtored. For this reaſon Sydenham [a] obſerves to us, that it is dangerous to endeavour at once to remove the diſeaſe by the bark, while the fit is either preſent or at hand; for that then, by ſuffocating the motion which would remove the obſtructions about the extremities of the veſſels, one might deſtroy the patient, as it had been known by many inſtances;

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[z] Herm. Boerh. Inſtit. Medic. § 220.

and

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[a] Sect. I. cap. 5. pag. 113.

and hence this incomparable and in itſelf ſalutary medicine has been diſgraced, when the fatal event ought to have been juſtly aſcribed to the miſconduct of thoſe who gave it. Hence we begin to perceive how a fever often performs the action of a medicine with reſpect to other diſeaſes, as we ſhall afterwards explain at § 589.

A concoction.] When the ingeſted aliments are converted into our own nature by the efficacy of the veſſels and viſcera, ſo that they can reſtore the ſolid and fluid parts which are daily waſted by the actions of life and health, they are ſaid to be concocted; for as we obſerved from Galen in the comment to § 25, *Concoctio eſt in coquentis ſubſtantiam deductio quædam ejus quod concoquitur*: "Concoction is a converſion of the concocted aliments into the ſubſtance of the parts which concoct or digeſt them." But this is not the uſe and action of that concoction which is the effect of a fever. For when that, which by its ſtimulus or coagulum has produced a fever, is by the ſame fever ſo changed as to be leſs offenſive and diſpoſed to expulſion from the body; it is then ſaid to be concocted, although it is not converted into the nature or ſubſtance of our healthy ſolid and fluid parts. When, for example, the impervious particles of the humours, wedged into the ultimate extremities of the arteries in inflammatory diſeaſes of the breaſt, are ſo changed by a fever, that by the impetus of the blood urging behind, they are ſeparated together with the extremities of the obſtructed arteries, and changed into a white, ſmooth, uniform pus or matter, by ſpitting up which, theſe diſeaſes are ſo frequently cured; we then ſay, there is a concoction made of the morbific matter, even though that matter can never be aſſimilated into healthy humours, but muſt of neceſſity be expelled to reſtore health. Hence it is evident that the concoction of the aliments made in a ſtate of health is very different from that which is made in diſeaſes. We may therefore for diſtinction ſake call a converſion of the ingeſted aliments into our own nature by the name (ϖέψις) concoction; and that change whereby the fever ſo alters its material cauſe as to render it leſs offenſive and diſpoſed for expulſion, may be termed ϖεπασμὸς, or maturation. Hence Galen [b] obſerves that this maturation in diſeaſes is a ſort of concoction of what is preternatural, but that it is different from what we properly call concoction, which changes the aliments into our own ſubſtance; and in this place he makes uſe of the two forementioned words diſtinctly. Yet in other places he often uſes the word ϖέψις, to ſignify that concoction or rather maturation which is made in diſeaſes, as Gorreus [c] very well obſerves: and in another place [d] the ſame author very juſtly diſtinguiſhes betwixt theſe, when he ſays that, concoction is the preparation of things entering into the body, but ϖεπασμὸς, or maturation, is the preparation of things to be expelled or paſſing out of the body. Duretus [e] likewiſe tranſlates the word ϖέπασμα, a maturation or ſoftening. Hence it is that Galen [f] always ſeeks for the ſigns of concoction in diſeaſes in the excreta, when he ſays, *Quod coctionis, quæ in ſpirandi inſtrumentis fit, ſputa; ejus vero, quæ in venis fit, urinas; illius autem, quæ circa ventrem, alvi excrementa, ſigna ſtatuere oporteat.* "That the ſigns of concoction

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[b] Comment. II. in Lib. I. Epidem. Charter. Tom. IX. pag. 55. [c] In Definit. Medic. pag. 509. [d] Ibidem. pag. 501. [e] In Coac. Hippoc. pag. 9. [f] De Criſibus Lib. I. cap. 7. Charter. Tom. VIII. pag. 387. & Lib. III. De Criſibus cap. 3. ibid. p. 429.

"coction happening in the organs of reſpiration, "ought to be expected in the ſpittle; but of that "which happens in the veins or arteries, in the "urine; and of that which is made in the ab- "domen, are to be expected in the fæces of the "inteſtines."

But that the fever itſelf is the cauſe of this maturation is allowed by the conſent of the beſt phyſicians, and proved by repeated obſervations in diſeaſes. Sydenham tells us in a place before cited (at § 558.) *Febris ipſa naturæ inſtrumentum eſt, quo partes impuras a puris ſecernat: hoc illa modo plane imperceptibili facit in principio atque etiam in ἀκμῇ morbi, verum in ejuſdem declinatione apertius, id quod ex urina cernere licet.* "That the fever is "an inſtrument of nature herſelf, whereby ſhe "ſeparates the impure from the pure parts; and "that this ſhe does in a manner altogether im- "perceptible in the beginning and in the height "of the diſeaſe; but in the declination thereof "ſhe makes this ſeparation more manifeſtly, "which one may perceive in the urine." Hence this great man placed the chief cure of fevers in keeping up the febrile motion to a juſt and moderate degree, leſt becoming over violent it ſhould deſtroy the tender veſſels of the encephalon and lungs, or at leaſt block them up with an impervious liquid; or on the other hand leſt the febrile motion becoming too weak or dull, ſhould render the concoction and attenuation of the morbific matter leſs perfect. Hence alſo he ingenuouſly confeſſes, that if the magnitude of the fever ſeemed ſufficient to make a concoction of the morbific matter without threatening any danger, he did nothing himſelf in that caſe, but committed the whole buſineſs to nature. And in this he followed the ſteps of the great Hippocrates[g], who ſo frequently

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[g] De Articulis. Charter. Tom. XII. pag, 362.

quently made himſelf only a ſpectator in diſeaſes, as is evident from many parts of his Works, and as he expreſsly tells us himſelf, when in treating of the cure of a broken ear, he ſays, *interdum enim optima medicina eſt, medicinam non facere, & ad aurem & ad alia multa.* "For ſometimes the "beſt medicine is to do nothing as well in a broken "ear as upon many other occaſions." All this is confirmed by what has been ſaid in the hiſtory of inflammation (§ 387.) for when the obſtruction is ſo great as to be irreſolvable, it can only go off by ſuppuration, during the performance whereof the fever, heat, pain, pulſation, *&c.* are increaſed, and by this means all the inflammatory and irreſolvable matter, together with the obſtructed ends of the veſſels in which it is depoſited, are concocted and changed into an uniform white and thick matter called pus. But when this maturation is impeded by a perverſe treatment, an incurable ſcirrhus frequently remains ever after, incapable of being reſolved or diſperſed by all the endeavours of art, and can only be removed either by the knife or cautery.

A ſecretion of the matter concocted.] For as was ſaid before, the matter concocted in fevers is rendered ſo mild as to be leſs capable of injuring and diſturbing the actions of the body, than while it was crude; but in the mean time there is nevertheleſs often ſuch qualities in the matter concocted, as will not permit it to be aſſimilated into healthy humours, and become obedient to the laws of an equable circulation. In ſuch caſe then the concocted and maturated parts are ſeparated from the reſt of the humours, and expelled either by urine, ſweat, ſtool, *&c.* or elſe being collected together in ſome certain part, they form an abſceſs by metaſtaſis or tranſlation, as will be hereafter demonſtrated in the ſeveral hiſtories of acute, febrile diſeaſes. But this ſecretion of the concocted matter is made by the fever; and if it does not happen, a return of the fever is to be expected, as Sydenham [h], who calls this a depuration of the blood in diſeaſes, learnt by a careful obſervation. For he obſerved in an acute continual fever, that about the fourteenth day, the matter which had been thereby concocted, was uſually expelled in a moderate ſweat: but that when the patient was too much weakened by purges, clyſters, &c. though they might ſeem to give ſome relief at that time of the diſeaſe, yet for want of this diſcharge a new fever was kindled, taking perfectly the ſame courſe as the firſt, which had been ſuppreſſed indeed by weakening the patient's ſtrength, but not cured; becauſe the ſecretion and expulſion of the concocted matter had been hindered by a perverſe method of cure.

A criſis or critical diſcharge of that which by its ſtimulus or coagulum produced the fever.] Criſis, literally ſignifying judgment, is derived *ἀπὸ τȣ͂ κρίνεσθαι*: it very frequently occurs among phyſicians in the hiſtory and cure of diſeaſes, and therefore it will not be amiſs for us to examine in this place what is commonly underſtood by it.

Galen [i] would have only a ſudden alteration of a diſeaſe towards health, to be ſimply intended by the word, becauſe ſuch a change always happens by manifeſt diſcharges or ſome remarkable abſceſs; but becauſe this is uſually preceded with a great diſturbance in the body of the patient, and the diſeaſe often at that time diſplays itſelf with terrible ſymptoms, many of which are enumerated by Galen in the place mentioned, it is no wonder that thoſe who attend upon the patient being at that time much affrighted, ſhould from the urgency of the caſe pronounce that a deciſive judgment was then to be made of the patient's life; Galen would therefore have this term rather contrived by ignorant people than phyſicians; but then this ſudden alteration towards a recovery of health is called a criſis only by way of eminence [k]; for a change to ſudden death he alſo calls a criſis, only with the addition of bad; and thoſe diſturbances which only make ſome conſiderable change, without entirely removing the diſeaſe, he calls imperfect criſes.

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[h] Sect. I. cap. 4. 72, &c.

[i] De Criſibus Lib. III. cap. 2. Charter. Tom. VIII. pag. 429.

It is not every change therefore of a diſeaſe into health which Galen calls a criſis, but only that which happens ſuddenly, and with ſome remarkable diſturbance in the body preceding, or often attending; for thus Galen [l] expreſſes himſelf in another place; *ſæpius vero neque ulla criſis fit ſtatus tempore, ſed paulatim ſolvitur morbus, longo tempore coctionem recipiens.* "But frequently "there happens no criſis at the ſtated time, but "the diſeaſe goes off gradually, taking up a long "time in the concoction." And a little after he ſubjoins; *hujuſmodi ſolutionem neque criſim nomino: ſi qua vero confertim fiat permutatio, & multo magis eam perturbationem, quæ illam præcedit, ita appello.* "Yet do I not call this kind of ter-"mination in the diſeaſe a criſis: but I call it ſo "when it has been preceded with a ſudden change "and great diſturbance." He would alſo [m] have us to underſtand a criſis to take place in great diſeaſes, but that ſlight diſeaſes go off by reſolution. Moreover, he would have us take notice [n] that always

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[k] Ibid. cap. 1. pag. 428.

[l] De Criſibus Lib. I. cap. ultimo. Charter. Tom. VIII. pag. 406.

[m] De Criſibus Lib. III. cap. 4. Charter. Tom. VIII. pag. 433.

[n] Ibid. cap. 10. pag. 444.

ways ſomething new or uncommon happens either in the breathing, hearing, ſight, eaſineſs of apprehenſion, *&c.* about the time when a criſis is to follow, all which he then calls critical ſigns or ſymptoms.

Nor does Galen [o] always call a termination of the diſeaſe in death a criſis; for he remarks, that patients frequently die in the beginning of the diſeaſe without a criſis, in great Inflammations of the principal parts, or through the great quantity, thickneſs and tenacity of the humours, which ſuddenly flow inward, and obſtruct the courſe of the ſpirits; and ſometimes that this happens in the height of the diſeaſe, when its force over-powers nature; and ſometimes again, but rarely, in the decline of the diſeaſe, the vital ſtrength being broke or exhauſted. But he obſerves, that in theſe caſes nature made no attempt to repulſe the diſeaſe, being over-powered by its magnitude; but that if nature made ſuch an attempt and failed, ſo as to excite any remarkable diſcharge or abſceſs with diſturbance, then he calls it a criſis, but a bad one.

Galen alſo remarks [p], that a criſis happens not in the beginning, but at the height of a diſeaſe, and is then always the beſt; but if it ſometimes happens in the increaſe of the diſeaſe, it is then imperfect, and always at leaſt leſs ſafe.

From all that has been ſaid, it is evident that a criſis is ſuppoſed to attend in diſeaſes, when great diſturbances happen, and new ſymptoms ſuddenly appear; and when theſe are followed with a ſudden alteration of the diſeaſe, either for better or worſe: alſo that this change is followed or accompanied with conſiderable diſcharges, or elſe a depoſition of the humours into certain parts of the body, which is an abſceſs. For it was ſaid before in the comment to § 402, that under the name of abſceſs, the antient phyſicians comprehended that endeavour of nature by which certain offenſive parts were ſeparated from the blood, and expelled out of the body, or depoſited in ſome place; and therefore the antients diſtinguiſhed two kinds of abſceſſion, the one by efflux, and the other by tranſlation or ſettling upon ſome parts.

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[o] De Criſib. Lib. III. cap. 9. Charter. Tom. VIII. pag. 442. [p] Ibid. cap. 10. pag. 444.

But all the appearances which accompany a criſis, or which follow after, are included in that denomination. Hence they are frequently called critical perturbations or diſturbances; and that which is expelled ſoon after the criſis, is called a critical diſcharge; as the matter ſettling upon ſome particular part, as well as before it is ſeparated from the reſt of the humours, is termed the critical matter, *&c.*

The moſt evident criſis therefore, and the greateſt diſturbances happen towards the height of the diſeaſe, or at its greateſt increaſe, at which time there is a ſort of equal and doubtful combat betwixt the vital powers and the morbific matter to be conquered, till nature over-powers the diſeaſe, or till ſhe herſelf falls a victim thereunto; the former of which is termed a good criſis, and the latter a bad. But when after this ſtruggle nature is neither totally triumphant over the diſeaſe, nor altogether ſubjected to it, the criſes are termed imperfect.

Concerning theſe criſes, Galen [q] obſerves, *Si morbi in hoc tempore criſim non habuerunt, fieri non poteſt, ut in declinatione habeant: quicumque enim ſtatus tempus ſemel prӕterierint, hi ſine criſi perſeverant,*

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[q] De Criſib. Lib. III. cap. 5. Charter. Tom. VIII. pag. 436.

*verant, & paulatim ſolvuntur.* "That if the diſ-"eaſe has not a critical turn at this time, that is, "about the height, it cannot have it in the de-"cline: for whatever diſeaſes have once paſſed "over the time of their height, ſuch continue "without a criſis, and are gradually reſolved."

But that criſes may happen at other times of the diſeaſe cannot be denied; and Galen [r] himſelf affirms it, when he ſays, *Criſes omnibus diebus accidunt, ſed neque pares numero, nec æquali fide.* "Criſes happen on all days, but are neither equally "certain, nor kept to the ſame number." For on the ſeventh day of the diſeaſe, on which common acute fevers come to their height, he had ſeen ſo many criſes happen, that he could not even number them, whereas he had ſeen more on the twelfth or ſixteenth day. On the ſixth day indeed he had obſerved criſes, but ſuch as were without the due ſigns, obſcure, imperfect, or not to be relied on, and of ill conſequence, or elſe accompanied with ſevere ſymptoms and the greateſt danger. For after the diſeaſe has arrived to its height, it naturally declines by degrees; and on the contrary, the natural powers which remain in the patient, increaſe in proportion as the diſeaſe declines; whence thoſe parts of the ſolids and fluids which were depraved by the violence of the diſeaſe, are gradually concocted and diſpoſed for excretion, which in that caſe happens immediately after the decline of the diſeaſe, and is generally accompanied with leſs diſturbances than when it is performed during the greateſt violence of the diſeaſe. But a criſis is alſo properly ſaid to attend when new ſymptoms ariſe, and the diſeaſe is either removed or diminiſhed, according as the morbific matter is expelled either wholly or in part. But the longer the diſeaſe continues before the criſis, ſo much the more is the violence of the critical perturbation leſſened, as well as the quickneſs of the change: for thoſe criſes which happen in the height of diſeaſes often terminate in a few hours time, and ſometimes even ſooner, being frequently followed with the moſt troubleſome ſymptoms. Galen obſerves [s], *Morbis autem inveteraſcentibus contingit, & judicia vehementiam perturbationis, & alterationis brevitatem, remittere, & ad duos ſæpe dies vel tres extendi.* “But criſes happening when the diſeaſes are grown old or of long ſtanding, are attended with vehement perturbations, and the continuance of the alteration is lengthened, ſo that a criſis is often extended to two or three days.”

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[r] De Diebus Criticis Lib. I. cap. 2. Charter. Tom. VIII. pag. 452.

Hence it is evident what the antients underſtood by the term criſis, although they have ſometimes with leſs exactneſs, made uſe of the word to denote the ſolution of a diſeaſe, even without any apparent diſcharge or abſceſs. Thus Galen [t] remarks, that Hippocrates, in the firſt and third book of his Epidemics, not only once or twice, but frequently calls the termination of the diſeaſe a criſis. Even Galen himſelf [u], where he treats profeſſedly of criſes, has the following paſſage; *Sive ſubitam in morbo mutationem, ſive ad meliorem ſtatum inclinationem ſolam, ſive perturbationem ſolam, quæ eas antecedit, ſive omnem morbi ſolutionem; ſive eam tantum, quæ bona ſit, criſim quis velit appellare, non eſt mihi, niſi obiter, hoc in loco diſtinguere propoſitum; ſed quo pacto hæc omnia quiſpiam optime prænoſcat, percenſere decrevi.* “Whether any one chuſes to call by the term criſis a

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[s] De Diebus criticis Lib. II. cap. 5. Charter. Tom. VIII. pag. 481. [t] Ibid. pag. 482. [u] De Criſibus Lib. I. cap. 1, Charter. Tom. VIII. pag. 377.

“ ſudden change in the diſeaſe, or an inclination of it only to a better ſtate, or merely a diſturbance which precedes ſuch a change, or an entire ſolution of the diſeaſe, or only that ſolution which happily ſucceeds, is not my buſineſs in this place to diſtinguiſh, except curſorily; but by what means any one may well fore-know all theſe is the deſign of my enquiry.”

It has been frequently diſputed, whether the maxims, which have been handed down to us by the antients concerning the criſes of diſeaſes, are obſerved to hold true in the diſeaſes which occur in our days. Thus Hollerius[w] ſays, *Apud nos rarius incidere repentina illa & perturbationis plena judicia, quas* κρίσεις *proprie appellant*; *ſæpius autem exſolvi morbos alternantibus coctione & excretionibus.* “ That among us, thoſe ſudden, full, and critical perturbations rarely happen, which the antients properly call criſes; but that diſeaſes are oftener carried off by alternate excretions and concoction.” And this he believed to proceed from the difference of our climate or air, an intemperate way of living, or becauſe the phyſicians more frequently weaken nature by bleeding and the exhibition of medicines; and to theſe he adds alſo, becauſe it is cuſtomary with us to ſupply the patient with greater plenty of nouriſhment than what was uſual with the antients. But although there ſeems to be ſome truth and reaſon in all this, yet it cannot be denied, that in our days criſes are commonly obſerved in diſeaſes, and that the knowledge of them is of the greateſt uſe to the phyſician.

In the mean time, we muſt confeſs, that phyſicians do not always uſe that diligence in the obſervation of diſeaſes, which we find in the accounts given us by the antients. They carefully remarked each change which appeared every day of the diſeaſe, and by that means found out the manner in which nature cured diſeaſes, following preciſely in her footſteps. But who is there that will devote ſo much of their time to ſuch a tedious obſervation in each diſeaſe? They who have the beſt opportunities of enquiring into this matter by an ample practice, are often oppreſſed with ſuch numbers of the ſick, that it is impoſſible for them to attend to every circumſtance. There are alſo a great many phyſicians, who after making ſome obſervations, and not finding them agree immediately with what has been ſaid on the criſis and critical days with their indices by the antients, they altogether neglect them for the future, and believe that at leaſt in theſe climates they are of no uſe. Being very ſenſible of my own weakneſs, and therefore perſuaded that my teſtimony can avail little in ſo weighty a matter; yet I believe I may venture to ſay what I have obſerved in diſeaſes, with regard to the preſent ſubject.

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[w] Comment. in Coac. Hippocrat. pag. 398.

In the treatment of acute diſeaſes more eſpecially, not truſting to my memory, I uſed to write down before the patient every thing that I could obſerve each day through the whole courſe of the diſeaſe, and after returning home it was my practice to reduce them into order. In this manner have I prepared for myſelf ſome hundreds of acute caſes through every ſtage of the diſeaſe, remarking at the ſame time, what I had ordered the patient either in the way of diet or medicine. I was pleaſed with this labour, becauſe I could by this means beſt diſcover the errors committed in the cure of diſeaſes, and avoid them for the future: and alſo becauſe I did not dare to call in the advice of our great profeſſor, which I ſo often found neceſſary, if I had not an accurate hiſtory of the diſeaſe. For the incomparable Boerhaave, who knew how to frequently excuſe a ſtumbling ſcholar in more weighty matters, would yet reſent with a ſevere countenance, a want of due attention in a matter which regarded life.

But when I afterwards compared the maxims of Hippocrates and Galen with what I had thus obſerved in diſeaſes, I with great pleaſure ſaw the truth of what they pronounced; and I perceived that the chief fault lay in our being ſo forward to make the antient phyſicians wiſer, and preſage more than they intended.

For criſes do not happen in all diſeaſes, nor are the critical perturbations always ſo violent as we have before mentioned to have been confirmed to us by the teſtimonies of the antients. This is alſo obſerved to us by a moſt weighty author in this matter, Sydenham [x]: *Dari nempe quaſdam febrium ſpecies, quas natura methodo ſibi peculiari, ſine viſibili aliqua evacuatione ablegat, reducendo ſcilicet in ſanguinis maſſam, illique aſſimilando materiam illam morbificam, quæ cum eo minus quadrabat.* "Namely, that there are ſome kinds of "fevers, which nature removes by ways pecu"liar to herſelf, without any viſible evacuation, "to wit, by returning the morbific matter into the "maſs of blood, and there aſſimilating whatever "was foreign to the maſs." And he freely confeſſes, that he uſed no endeavours from art in the cure of theſe fevers, but only gave a very thin ale or malt drink, permitting in the mean time a free uſe of the air, and wonted exerciſes; and in this moſt ſimple manner, he recovered his children and moſt intimate friends, whence there could be no ſuſpicion that a criſis did not follow from any impediment by art. The ſame author obſerved, that in thoſe years, when autumnal intermittents were the moſt common, a continual fever occurred, in which nature ſo moderated all the ſymptoms, as to diſpoſe the febrile matter prepared by a due concoction, to be diſcharged at its certain time; and this fever he called depuratory, being of opinion, that this was primarily a fever of nature, becauſe it more frequently occurred than any others, and was more regular throughout the whole courſe of the diſeaſe. But with this fever he ſays, agreed thoſe eminent and neceſſary rules delivered to us by Hippocrates and other antient phyſicians; and he alſo obſerves to us that theſe rules do not always anſwer in other kinds of fevers, which are of an unſettled and very different nature.

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[x] Sect. V. cap. 2. pag. 284.

Beſides this, death itſelf frequently follows in diſeaſes without a criſis, as Galen [y] obſerves, where he gives us the ſigns whereby the ſame may be fore-known in the following words; *Primum & maximum in morbis lethalibus ſignum, quod ſine criſi mors eſt ſubſecutura, eſt virium imbecillitas: nam virtus ita proſtrata ad pugnam contra morbum non excitatur. Secundum vero, ſi nullum adſit ſignum vel minimum coctionis; & præter hæc ſi morbus magnus ſit & malignus, atque etiam celeriter moveatur: quum enim hæc adfuerint, mors ſequetur omnino abſque criſi.* "The firſt and greateſt ſign in "fatal diſeaſes that death will follow without a "criſis, is a weakneſs of the faculties or powers "of the body; for the forces being thus damped, "cannot be raiſed to fight againſt the diſeaſe. "But the ſecond is when no ſign attends, even of

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[y] De Criſibus Lib. III. cap. 10. Charter. Tom. VIII. pag. 443.

" the leaſt concoction, the diſeaſe itſelf being in
" the mean time great, malignant, and running
" on with celerity: For when theſe are preſent,
" death will follow without any criſis.

Many phyſicians alſo perceiving that fevers returned when the patient ſeemed well, and even after a manifeſt criſis; and finding others, which they had pronounced to be well, attacked a long time after with a dangerous diſeaſe, have been brought to deſpiſe and neglect all that relates to criſes. But theſe diſappointments have been already obſerved to us by the antients, who have alſo given us the ſigns by which theſe returns after criſes may be predicted. For it frequently happens in more violent diſeaſes that nature cannot conquer the diſorder by one ſtruggle; but after falſe hopes have been conceived the diſeaſe again breaks out, and cannot be entirely conquered, without by exciting new diſturbances, the morbific matter which ſtill remains in the body is expelled, and that frequently not by one but many emunctories. Hippocrates [z] ſupplies us with a remarkable inſtance, proving all theſe particulars. A man lay ill of an acute and dangerous fever attended with terrible ſymptoms, livid frothy ſtools, a livid ſediment in the urine, watchings, ravings, *&c.* on the ninth day he was taken with a ſhivering and ſweat, but the delirium and many bad ſymptoms ſtill continued. On the eleventh day he came to his ſenſes, ſweated and was free from the fever: **But** Hippocrates particularly adds that the urine was thin or clear at the time of the criſis, which he had always condemned in acute diſeaſes, whence there was danger of the fever's returning, as it did on the fourteenth day; for after being free two days the fever returned again with watchings and delirium. On the ſeventeenth day he had a ſweat throughout his whole body, which relieved him, and he came more to his underſtanding; but ſtill the fever continued with a thin urine and not well coloured: On the twentieth day he again ſweated, was without the fever, but the urine was ſtill thin; at length on the fortieth day he had a copious white phlegmatic diſcharge by ſtool, and much ſweat flowing from his whole body made a perfect criſis.

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[z] Epidem. 3. Ægrot. 3. Charter. Tom. IX. pag. 222 — 228.

I confeſs that when ſuch caſes as theſe occur'd to me in the cure of diſeaſes, I was often doubtful, hardly knowing what to believe concerning the prediction of criſes. I well remember that eſpecially the following caſe, which I ſhall briefly relate, made me ſo over-bold that I was twice out in my prognoſtic in the ſame diſeaſe. In a healthy ſtrong man afflicted with a pleuriſy, after twice bleeding the violence of the diſeaſe abated; after this on the ſixth day of the diſeaſe, having had a very troubleſome night, he diſcharged an incredible quantity of urine, which immediately appeared turbid, and depoſited a very copious ſediment afterwards. The patient ſaid that he not only voided this water eaſily, but with a ſort of pleaſure. The night following was ſufficiently quiet, and I had predicted that this critical diſcharge by urine ſhould carry off the diſeaſe. On the ſeventh day there was a profuſe bleeding at the noſe, the fever was much leſſened, and now at leaſt I thought the diſeaſe muſt be certainly conquered. But he complained next day of a ſenſe of weakneſs in his loins, and was not altogether free from the fever. On the tenth day of the diſeaſe he felt ſomething of an obtuſe pain, and upon riſing out of bed was lame in the right leg. On the eleventh day there was a a pain in the right groin, and although he could move his leg without any pain in the bed, yet upon raiſing up it was lame; but in other reſpects the fever was entirely off, and all the functions of the body in a healthy ſtate. This made me predict an abſceſs near the joint of the hip; but on the twentieth day of the diſeaſe he diſcharged urine which looked turbid as ſoon as made, and depoſited a great quantity of a white uniform ſediment, whereby the pain of the part affected was immediately leſſened; but two days after he had a clear limpid urine, whereupon the pain immediately returned, and went off again when the urine became thick and white. After I had collected together the obſervations which I had read in the ancient phyſicians, and diſpoſed them in ſuch order as to find them readily in each diſeaſe that occurred, I then began to compare with them the hiſtories of diſeaſes which I had before taken down, and I then ſaw what each ſign denoted which had occurred to me in the preſent caſes. For on the ſixth day of the diſeaſe we are told in many places of Hippocrates and Galen, that a criſis very rarely or never happens, in the truth of which we may confide. Beſides this, Hippocrates [a] had remarked; *Quæ in morbis poſt criſim reſidua immorantur, recidivas facere ſolent.* "That "the reliques which are left in diſeaſes after a "criſis uſually cauſe returns." But after this copious hæmorrhage or diſcharge of urine, there were ſtill ſome remains of the fever accompanied with a ſenſe of weakneſs in the loins, all which ought to have made me ſuſpect that the diſeaſe was not yet perfectly conquered. Hippocrates [b] indeed tells us, *Si ex morbis convaleſcentibus aliquid doluerit, illic abſceſſus fiunt.* "That if any

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[a] Aphor. 12. Sect. II. Charter. Tom. IX. pag. 50. & 2. Epid. pag. 166. & 5. Epid. pag. 408.

[b] Aphor. 32. Sect. IV. Charter. Tom. IX. pag. 153.

" part becomes painful in thoſe who are recovering " from diſeaſes, they there make an abſceſs or " tranſlation of the morbific matter;" ſo that it was not without reaſon I feared an abſceſs at the joint of the hip: But in another place Hippocrates[c] obſerves; *Quibus ſpes eſt, ad articulos abſceſſum fore, eos abſceſſu liberat urina copioſa & craſſa & alba reddita*, &c. " In thoſe where there is reaſon to expect an abſceſs will happen about the joints, a " plentiful diſcharge of thick white urine frees " ſuch from the abſceſs, *&c.*" Thus I perceived myſelf out in prognoſticating, becauſe I did not well obſerve the practical rules of the antient phyſicians: For I ought to have predicted on the ſixth day ſome relief, but not a total recovery from the diſeaſe, and afterwards ſhould have obſerved that there was danger of an abſceſs, but that there was reaſon to hope it might be prevented.

It is therefore beſt for the phyſician not to be too preſumptuous in preſaging future events in diſeaſes, eſpecially if he has not been long experienced in his profeſſion, 'till uſe makes him more perfect, and his own miſtakes more cautious. For we ought always to be mindful of the admonition which Hippocrates[d] gives, namely, *Acutorum morborum non omnino certæ ſunt prædictiones, neque mortis neque ſanitatis.* "That the predictions in acute diſeaſes are " not altogether certain either with reſpect to " death or recovery." But from this laſt aphoriſm of Hippocrates ſome may object, that if nothing abſolutely certain can be concluded in the criſes of diſeaſes, what need is there to concern ourſelves ſo much about that matter? Yet it is certain that the obſervation of criſes is of the greateſt uſe in diſeaſes; for by that means we learn how and by what ways nature cures them, and

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[c] Aphor. 74. Sect. IV. Charter. Tom. IX. pag. 184.

[d] Aphor. 19. Sect. II. Charter. Tom. IX. pag. 59.

and we are admoniſhed not to diſturb her in that work by impertinent endeavours of art, as Hippocrates [e] prudently obſerves, where he ſays; *Quæ judicantur, & quæ perfecte judicata ſunt, neque movere, neque innovare oportet, nec medicamentis neque aliis irritamentis ſed ſinere.* "Thoſe methods of terminating diſeaſes which have been "or are about to be undertaken by nature, ought "neither to be removed or altered either by medicines or any other irritating thing, but ſhould "be left entirely to nature herſelf." For when by a careful obſervation we have learnt what courſe nature inclines to take, and by what paſſages to throw out the humours, we may forward thoſe intentions by ſuitable remedies, endeavour to render the matter moveable, and prevent every thing that may oppoſe ſuch a foreſeen evacuation. Alſo from what the antients have delivered to us concerning criſes and critical days, we may learn at what time of a diſeaſe thoſe great alterations are to be expected; and although from the weakneſs of human nature it will be impoſſible to be altogether free from error at ſome time in ſo great a variety of patients, yet as Celſus [f] juſtly obſerves; *Non tamen, ſi quid vix milleſimo in corpore aliquem decipit, id fidem non habet; cum per innumerabiles homines reſpondeat:* "We ought not therefore to reject "or miſbelieve what may deceive us perhaps hardly one time in a thouſand, if it anſwers in num- "berleſs patients." And the following ſentence of the ſame author is likewiſe moſt true; *Quod in vicino ſæpe quædam notæ poſitæ, non bonos, ſed imperitos Medicos decipiant; nec protinus crimen artis eſſe, ſi quod profeſſoris ſit* [g]. "That what

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[e] Aphor. 20. Sect. I. Charter. Tom. IX. pag. 36. [f] Lib. II. cap. 6. pag. 57. [g] Ibidem.

" often ſeems about to happen by certain fixed " ſigns, deceives not the good, but the unſkilful " phyſicians; nor is the fault to be immediately " thrown upon the art when it belongs to the " profeſſor of it." For it is not a ſlight care that will ſuffice for obſerving the progreſs of diſeaſes, but a ſtrict or ſcrupulous attention is required to every thing that happens therein. And in order from thence to form a juſt prognoſis, it muſt be carefully obſerved at what time of the diſeaſe thoſe ſudden changes appear, as we ſhall declare when we come to treat of critical days at §. 741. to prevent our preſent diſcourſe from running too great a length.

It is alſo to be obſerved, that all thoſe endeavours of nature by which the attempts to concoct, prepare and critically diſcharge the morbific matter, may be diſturbed by many things, either by the fault of the patient, phyſician, attendant, or ſome unavoidable accidents, which no human prudence could either foreſee or avert; as for inſtance, when the patient is diſturbed with ſudden anger, or ſome other violent paſſion of the mind. Of all theſe particulars we are admoniſhed by the moſt wiſe Hippocrates [h] in his firſt aphoriſm, which tells us; *Vita brevis, ars longa; occaſio præceps, experientia periculoſa. Oportet autem non ſolum Medicum exhibere ſe ipſum facientem, quæ decet; ſed & ægrotum & adſtantes, & externa.* " That life " is ſhort, art long, accidents ſudden, and expe- " rience dangerous For it is not only neceſſary " for the phyſician himſelf who takes care of the " patient to do his duty, but alſo the patient, at- " tendants, and other external things muſt con- " cur." As if he had told us (as Galen well obſerves in his commentary to this aphoriſm) that if any one

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[h] Charter, Tom. IX. pag. 1.

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one would form a judgment concerning the truth of what was contained in the following aphoriſms, he ought not only to preſcribe what is convenient for the patient, but that the patient ought to be obedient, and the attendants faithfully execute his directions; alſo that external things which are almoſt infinite ſhould be ſo managed as neither to diſturb the patient's ſleep, excite the paſſions of his mind, *&c.* For what diſorders often ariſe from ſuch diſturbances is ſufficiently apparent from daily obſervation, and from a remarkable inſtance in Hippocrates [i]: For after having ſaid, in deſcribing the epidemical conſtitution which then prevailed, that ſuch were chiefly preſerved as had a conſiderable diſcharge of blood from the noſe, or who had a great flux of urine with a laudable ſediment, or elſe bilious griping ſtools or a dyſentery; and having added that women and virgins with whom any one of theſe evacuations ſucceeded well, were always preſerved and cured, yet he excepts one, the daughter of Philo, who periſhed, notwithſtanding there was a pretty copious flux of blood from the noſe, and that becauſe ſhe ſupped unſeaſonably on the ſeventh day. Thus Sydenham often ſeverely complains that the patient's friends or attendants diſturbed every thing ſo much by the hot regimen in acute diſeaſes, though he had ſtrictly forbid it, that a great many thereby periſhed, or at leaſt were with great difficulty preſerved from the jaws of death. Galen [k] therefore juſtly condemns thoſe phyſicians, who did not believe they had proceeded agreeable to art, if they had not thrown up a clyſter, opened a vein, applied cupping-glaſſes, &c. and ſays that theſe always do miſchief when they come near the patient; for after ſo many errors being committed, it was altogether impoſſible for the motions of nature to happen at their ſtated periods.

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[i] Epidem. 1. Charter. Tom. IX. pag. 75.

[k] De Diebus criticis Lib. I. cap. 11. Charter. Tom. VIII. pag. 468.

But it ſeems very likely that thoſe phyſicians, who always by their activity diſturbed every thing, offended by their ignorance in not endeavouring to conduct all that they did, ſo as to avoid diſturbing the uſual efforts of nature for the removal of diſeaſes. But even in the following ages there have been phyſicians of this ſtamp, who have gloried in doing this with deſign. Thus Helmont[l] ſeverely exclaims againſt a criſis, and againſt the phyſicians who expected it in diſeaſes: For ſays he; *Boni enim & fidelis Medici eſt negligere criſes : præſtaretque ægros medente caruiſſe, quotquot per criſin evadunt, multo magis quorum criſis tardior eſt.* "It is the part of a good and "faithful phyſician to neglect the criſes; and it is "better for the phyſician who has the cure of "patients to be without a criſis, notwithſtanding "ing the number which may thereby eſcape; "and much more may this be ſaid of a very ſlow "criſis." And again in another place he ſays[m], *Bonus autem Medicus negligere criſes debet, quia anticipare. Nam natura criſim non facit, niſi dum ſola totum onus bajulat; ſtatis diebus. Verus ergo Medicus, ante criſim, morbum ſuperare debet, ideoque nec criſin exſpectat, nec optat,* &c. "That a "good phyſician ought to neglect criſes, becauſe "they anticipate his work. For nature does not "make a criſis on ſtated days, unleſs ſhe carries "the whole burden herſelf. A good phyſician "therefore ought to conquer the diſeaſe before a "criſis, rather than expect or wiſh for one, *&c.*"

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[l] In Capitulo De Tempore pag. 509. N°. 52. &c.

[m] De Febribus cap. 11. circa finem pag. 772. N°. 27. &c.

He tells us that in his younger days he wrote five books concerning criſes, which he afterwards committed to the flames[n]. But he would not even believe that diſeaſe oppoſed nature, and therefore he concluded that the name criſis was improperly aſſumed by the ſchools, ſince it followed without ſtrife or deciſion; *Criſis ergo, ut judicium, ſonet, eſto judex & accuſatrix medentium, & bajulantis ſolius naturæ teſtimonium.* "For a criſis, "ſays he, as the word imports judgment, is there- "fore both the judge and accuſer of phyſicians, "and only a teſtimony of loaded nature." For he boaſted that it was in his power to ſuppreſs diſeaſes at their firſt riſe, before they have made any conſiderable advance; and he proclaims thoſe unworthy the name of a phyſician who could not effect the ſame thing.

But it is as eaſy to promiſe many and great things as it is difficult to perform them, and there are always ſuch deceits uſed by boaſters in crying up their arcana, by which alone they can do miracles, but dare not divulge them becauſe of the malice and ingratitude of men. But until ſuch pretenders can ſhew themſelves able by experiment to effect what their own works confute, they will be deſervedly deſpiſed by every one.

It is indeed true, that many of the moſt dangerous diſeaſes ariſe from moſt ſubtle miaſmata communicated to the body, and only appearing to us by their effects; whence it would ſeem that if any one could expel the contagious matter from the body, or render it ſo unactive, as to excite no diſturbance, he might then inſtantly cure the diſeaſe, and prevent all thoſe ill effects which would otherwiſe follow. Thus he that could inſtantly correct the infection of the ſmall-pox, as ſoon as it is taken into the body might prevent the eruption, ſuppuration, and all the other ſymptoms that thence follow. But ſo long as ſuch an antidote to this poiſon is unknown, nothing remains for us but to attend carefully to the manner how, and the ways by which nature ſeparates and expels the received poiſon and corrupted humours out of the body, together with the remedies by which theſe may be promoted, how the diſturbances which often ariſe in theſe actions may be allayed, in what manner nature, often oppreſſed and languiſhing under the violence of the diſeaſe, may be ſupported and raiſed, *&c.* For we are certain that phyſic aroſe from a faithful obſervation of diſeaſes, and will ever be moſt promoted thereby.

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[n] In Capit. De Tempore pag. 510. N°. 55.

But although the ancient phyſicians have left us many excellent rules whereby we may diſcover the method, ways and times in which nature cures diſeaſes; yet we might reaſonably hope to enlarge and make them more perfect, if we make uſe of the ſame diligence in the obſervation of diſeaſes.

Nor yet are we to deſpiſe what is handed down to us by the ancients concerning diſeaſes, becauſe they were ignorant of the circulation of the blood, and many other beautiful diſcoveries ſince made; for they endeavoured to know and cure diſeaſes not by underſtanding their cauſes, but by a faithful obſervations of their effects. And even at the preſent day, though our age is happily ſupplied with an opportunity of uſing all the new diſcoveries, yet are we very far from being able to underſtand diſeaſes and their effects (à priori) from their cauſes. Hence it happens that when phyſicians endeavour to eſtabliſh general rules from a few known principles, they have only advanced ſhowy hypotheſes, which have in a little time fallen to the ground; and have therefore deſerted the common road of the ancients, to the great damage of the ſalutary art.

Even the beautiful diſcoveries and remarks which have been made in the cure of the moſt intricate diſeaſes by the worthy Sydenham, ought to inſpire the minds of every one, ſince without the help of theories, he by a diligent obſervation has collected all the appearances of the diſeaſes yet known to us, ſo as to form a moſt exact hiſtory of them, from whence naturally followed the juſt indications, which he ſo ſucceſsfully purſued in the cure of thoſe diſeaſes; and at the ſame time his accurate hiſtory of diſeaſes pointed out what might be feared or hoped for at different times of them, whence he derived a moſt certain prognoſis.

There has been very lately publiſhed a treatiſe containing many inſtances that teach us how well the obſervations handed down to us by the antients concerning criſes might be increaſed to advantage, by carefully attending to the diſeaſe throughout its whole courſe. Franciſcus Solano de Luque, a Spaniſh Phyſician, though little verſed in phyſical learning, has yet been able only by a careful obſervation of the pulſe in diſeaſes to predict various critical evacuations by urine, ſtool, ſweat, bleeding at the noſe, *&c.* and frequently even to determine the hour when theſe criſes were to be expected, to the great ſurpriſe of every one. This phyſician has publiſhed a pretty large volume concerning theſe matters, which he entitles Lapis Lydius a Pollinis, *&c.* in which with great candor he deſcribes thoſe changes of the pulſe which he had obſerved to precede thoſe criſes, and at the ſame time confirms the wonderful predictions which he had made and proved true in diſeaſes, by ſuch teſtimonies as leaves no opportunity to doubt of the truth of the hiſtory; for there are not only the moſt eminent citizens, but likewiſe many phyſicians his witneſſes, living in the ſame city with himſelf, and many of them too which were of a very different opinion when they met together in conſultation with him, who yet have been ſo candid as to confirm upon oath, that they had been deceived, and that the prognoſtics given by the author had proved true in the event. But as this treatiſe was written in the Spaniſh tongue, and abounded with many things little appertaining to the main deſign in view, therefore the learned Dr. James Nihell [o] extracted the principal matters, collected them together, and added obſervations of his own and others, whereby the critical rules of the ſaid Spaniſh phyſician are confirmed, and ſometimes limited, when he had lain them down too general. This ingenious phyſician taken with the novelty of the thing travelled to Antequera, where Solano dwelt, and converſed with him for the ſpace of two months; likewiſe conſulted the witneſſes nominated in his treatiſe, who all confirmed the truth of the account. But what is more, the author confirmed the truth of his predictions to him by practice on his patients, *&c.* the particulars of all which are methodically related in this entertaining treatiſe. The importance of the thing indeed is ſuch that it ought to be enquired into by all who are employed in the practice of phyſic: nor does it ſeem improbable but that more ſuch ſigns may be diſcovered in the reſpiration, urine, tongue, *&c.* at leaſt theſe ought to excite a careful attention to every thing which happens in the courſe of diſeaſes; for thus, as Galen obſerves, *Generoſus aliquis, & veri amator, & qui labores in pulcherrimis non refugit, neque theorematum*

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[o] New and extraordinary Obſervations concerning the Prediction of various Criſes by the Pulſe, &c. by James Nihell, London, 1741.

*matum difficultatem, neque temporis prolixitatem, neque exercitii laborem veritus, ad commemoratorum perfectionem veniet; ut non ſolum diem firmiter poſſit prædicere, ſed etiam horam ipſam, in qua ægrorum quemquam judicari, vel mori neceſſarium eſt.* "One free from prejudice and a lover of truth, "ready to undertake every thing laborious for its "uſefulneſs, and who is not affrighted either by "the difficulty of the theorems, the length of "time, nor the labour of the exerciſe, may "arrive to the deſired perfection; ſo as not only "to be able to predict certainly the day, but alſo "the hour itſelf, in which each patient muſt "of neceſſity either die or recover [p]."

An alteration of the healthy humours to a diſeaſed ſtate.] While the ſound humours flow freely through the pervious veſſels with a due impetus in a healthy perſon, all the functions of the body are moſt juſtly performed, *i. e.* health is maintained; but when the motion of the humours through the veſſels is increaſed in a fever, thoſe qualities which are required in the healthy humours are ſooner or later changed, and degenerate more or leſs according to the different nature, violence, and continuance of the fever. When a fever is excited in the moſt healthy body by the ſtimulating poiſon of the ſmall-pox, a great part of the humours is in a few days time converted into matter, or elſe, in the worſt ſpecies of the diſeaſe, into a gangrenous ichor. From too violent exerciſe of body in the ſummer heats, often ariſes a moſt ardent fever, which ſo changes all the humours as to diſturb every function, ſo that in three days after there is ſcarce any thing of health remains. Nor will this ſeem wonderful if we conſider what was ſaid before (in the comment to § 100.) on the effects of an increaſed motion of the blood with reſpect to the ſolid and fluid parts of the body. For thus the urine often becomes extremely ſharp, and in a meaſure putrid, as it waſhes off the ſalts and oils of the blood, rendered more volatile and acrid by the increaſed motion; the ſaliva is viſcid and of a putrid taſte, and the inteſtinal fæces are often very fluid, and of a cadaverous ſmell; the bile is converted into a moſt putrid liquor, *&c.* the blood in the mean time exhaling its moſt fluid parts acquires an inflammatory thickneſs, or ſometimes being invaded with a putrefaction, the whole maſs of it is diſſolved. But when theſe depravations of the humours are obſerved in bodies dead of a fever, they are often falſely accuſed of being the cauſe of the fever, when in reality they are only its effects. Thus critical evacuations have more eſpecially this uſe, that they expel from the body thoſe parts which have degenerated into a diſeaſed ſtate by the fever.

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[p] Galen. De Dieb. Crit. Lib. I. cap. 10. Charter. Tom. VIII. pag. 470.

The introduction of a new change in the healthy ſolids and fluids, *&c.*] We obſerved before in the comment to § 558, from Sydenham, that people who have ſuffered any conſiderable and ſudden alteration in the ſix nonnaturals, are uſually taken with a fever, by which they become afterwards more capable of ſupporting what they could not ſuſtain before without detriment to their health; and hence he takes occaſion to ſay [q], that when a fever ariſes from this cauſe, the new things grind or attenuate the blood. But this is confirmed by frequent obſervation, more eſpecially in thoſe who go into foreign countries. Alſo in many diſeaſes which are accompanied with a fever, we ſee the bodies of people are ſo altered, that they afterwards ſuſtain the ſame cauſes without damage, though frequently applied, from whence they were firſt diſordered. Thus a perſon who has once had the true ſmall-pox is not infected again, though he every day converſes afterwards with thoſe who lie ill of the diſeaſe. Thucydides [r], deſcribing the terrible plague of Athens, remarks, that thoſe who eſcaped after being invaded with this infection, lived for the future free from the peſtilence. Yet the obſervations of the more modern authors who have wrote upon the plague, teach us that people are often ſeized again with the ſame peſtilence, and that many who have once eſcaped, have been afterwards infected again. During the peſtilence, which about thirty years paſt raged almoſt throughout Europe among the cattle of the oxen kind, the country-men in theſe parts would give almoſt any price for cows that had once had the diſeaſe, becauſe they never or very rarely were again ſeized with the plague. Thus alſo Sydenham [s] remarks, and I have frequently obſerved it myſelf, *Quod cujuſcunque demum ætatis aut temperamenti fuerit is, qui quartana corripitur, ſi quolibet alio vitæ tempore (vel etiam ab hoc remotiſſimo) eadem ſemel laboraverit, non diu admodum eum ſecunda hac vice fatigabit morbus, ſed poſt paucos aliquot paroxyſmos ſponte ſolvetur.* "That whatever age "or temperature the patient is of who is taken "with a quartan, if he was ever afflicted with it "before in the former part of his life, however "remote it may be from the preſent time, the "diſeaſe will not fatigue him long the ſecond "time, but will go off ſpontaneouſly after a few "fits."

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[q] Sect. I. cap. 4. pag. 61.

An expulſion of the more fluid parts, and a thickening of the reſt.] It was demonſtrated in the comment to § 100. that by the increaſe of the motion of the circulation which attends in every fever, the watery and thinneſt part of the humours are exhaled or carried off, and that from this loſs the reſt are thickened, which might be the cauſe of the very worſt obſtructions. Hence thoſe who have been ſubject to profuſe ſweats in each fit of an intermitting fever, are often afflicted afterwards with the moſt ſtubborn obſtructions in the abdominal viſcera. For this reaſon Sydenham was ſo ſolicitous to prevent ſweats ariſing, as well in the beginning of the ſmall-pox from a hot regimen, or too great a weight of bed-cloaths, as in the beginning of other acute diſeaſes; for by that means the blood being deprived of its diluting vehicle became diſpoſed to ſtagnate in the ſmalleſt extremities of the veſſels; whence he obſerved that the worſt inflammations, phrenzies, purple ſpots, and the like malignant ſymptoms often followed. Hence alſo Hippocrates tells us, that thoſe who die of an ardent fever periſh by drineſs (ſee the comment to § 100.) for we ſee that in ſuch patients before death the tongue and fauces are extremely dry, the whole ſkin feels rough and parched, the eyes look with a duſty drineſs, and the whole body in every part both external and internal ſeems withered and juiceleſs, as we are taught from the diſſection of the dead bodies.

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[r] De Bello Peloponneſiaco Lib. II. pag. 102.

[s] Sect. I. cap. 5.

Nor is it any objection to this, that dropſies ſometimes follow after continual fevers, and that the whole body ſwells with a watery defluxion. For in theſe caſes indeed the fever expelled the thin humours from the body, but ſuch as were aſſimilated or concocted; but great quantities of crude drinks being taken in to allay the thirſt that generally attends, which the ſtrength of the body weakened by long fevers is neither able to move nor expel, they ſtagnate, and are collected in the larger or ſmaller cavities.

But from what has been hitherto ſaid, the reaſon of thoſe ſymptoms will eaſily appear which follow in the text; and concerning which I ſhall therefore ſpeak more briefly, becauſe we ſhall treat of moſt of them hereafter under their particular titles.

Thirſt.] For this follows from a drineſs and imperviouſneſs of the humours, as we ſhall explain hereafter at § 636. becauſe when the moſt fluid parts of the humours have been diſſipated as before mentioned by a fever, what remain are inſpiſſated. Moreover, as by a fever the healthy juices acquire a morbid diſpoſition, and often degenerate into a greater acrimony, as we have already demonſtrated; from thence again we have another reaſon why thirſt ought to be reckoned among the effects of a fever.

Heat.] It was demonſtrated in the comment to § 100. that an increaſe of the circulatory motion renders the mutual attrition betwixt the blood and the veſſels more violent, and therefore a greater heat muſt follow, concerning which we ſhall ſpeak more largely when we treat particularly of heat in fevers at § 673.

Pain.] Which ariſes either from a diſtraction of the veſſels diſtended by impervious juices, and in the mean time ſtretched by a greater impulſe urging behind; or elſe from a change in the healthy nature of the humours degenerating from their mild into an acrid ſtate, ſo as to injure and irritate the ſenſible nervous parts (ſee § 220.) Thus when the bile is rendered more acrimonious in a fever, and lodges about the præcordia, a moſt ſevere head-ach attends, which is immediately relieved upon the removal or diſcharge of the bilious matter.

Anxiety.] For this is cauſed (as we ſhall explain hereafter at § 631.) by impeding the egreſs of the blood from the heart, whether the impeding obſtacle be lodged in the extremities of the pulmonary artery, or thoſe of the aorta. It is to be alſo obſerved that this troubleſome ſenſe of anxiety or oppreſſion is perceived, when the blood cannot paſs through the narrow extremities of the venæ portæ. But we have demonſtrated that in fevers the moſt fluid parts of the blood are often expreſſed, and the reſt inſpiſſated; ſo that hence the impervious humours are incapable of paſſing thro' the ultimate extremities of the fore-mentioned veſſels. The ſame effect may be alſo produced by a contraction, or too great a narrowneſs of the veſſels themſelves, through which the free paſſage of the humours is obſtructed. Hence in the cold fit of intermitting fevers, the greateſt ſenſe of anxiety or oppreſſion is often perceived.

Weakneſs.] For this ariſes (as will appear at § 661.) either from a defect in the quantity, or from the imperviouſneſs of the humours, or elſe from an obſtruction of the canals through which the humours flow. But it is evident that all theſe bad accidents may follow from a fever, and conſequently they may produce a weakneſs. Thus we often obſerve in the beginning of fevers of the worſt kind, that all the ſtrength of the body is immediately exhauſted, which is indeed always a bad ſign, becauſe it denotes the greateſt malignity of the diſeaſe.

Warineſs or laſſitude.] Which is ſaid to attend when the voluntary motions cannot be performed without a ſenſe of uneaſineſs, numbneſs, and ſometimes a ſort of obtuſe pain, like what happens in healthy people tired with too much exerciſe, eſpecially ſuch as they have not been uſed to. This troubleſome ſenſe of laſſitude ariſes from too great a waſte of the moſt ſubtle fluid required in the motion of the muſcles, and from a too violent or long continued agitation of the parts of the body. But in fevers the moſt fluid humours are often expelled, while in the mean time many of the functions being injured, the loſs cannot be quickly ſupplied from the nouriſhment taken in, whence a deficiency in the ſpirits muſt follow. This is much increaſed by thoſe reſtleſs agitations in bed, and the uneaſy trembling of the body, which uſually accompanies the cold fit of intermitting fevers, whereby all the limbs are violently ſhook.

Heavineſs or oppreſſion.] So long as there is a free motion of the humours through all the veſſels, a perſon is active, in perfect health, and does not perceive the weight of his own body; but ſo ſoon as any impediment ariſes to the free circulation of the humours, immediately a ſenſe of heavineſs is perceived either throughout the whole body, or at leaſt in the part affected. As for example, a perſon who has a violent phlegmon ſeated in one arm, will feel it heavy almoſt like lead. It was known and obſerved by Diocles, who from the greatneſs of his ſkill acquired among the Athenians the name of Hippocrates the younger, that the nature of animals conſiſted in a virtue or power ſuſtaining the body, and in the body itſelf ſuſtained by that power[t]. Hence ſo ſoon as that ſuſtaining power is weakened, the body cannot be ſupported without difficulty and uneaſineſs. But this virtue ſuſtaining the body depends on a free influx of ſpirits and arterial blood into the muſcles, and therefore ſuppoſes the circulation perfectly free, which yet appears to be diſturbed in fevers in the manner

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[t] Holler. Comment. in Coac. Hippocr. pag. 405. & 941.

anner before explained. And therefore Hippo-ates[u] ſo much condemns it as a bad ſign in diſ-ſes for the arms or legs, or the reſt of the body to em heavy; and on the contrary eſteems it one of e beſt ſigns when the patient can turn himſelf ſily in the bed, and finds himſelf chearful or clined to action upon riſing up.

Loathings or averſion to food.] When there is deficiency of thoſe cauſes which are required to preſent in the healthy animal for the digeſtion of e aliments, the appetite is either entirely loſt, or uch impaired. But towards a good digeſtion any cauſes are required to concur, and among oſe more eſpecially the juice of the ſtomach, in-ſtines, pancreas, and both kinds of bile are re-iired to be well conditioned. But it has been ade evident that by fevers the humours are of-n changed to a morbid diſpoſition, and that a-ove all the bile moſt frequently and ſooneſt de-enerates in fevers, whence it is that we ſo fre-uently obſerve bilious vomitings, diarrhæas, bit-r ructus's and intolerable taſtes in the mouth, *&c.* nd then the appetite is always deſtroyed at the me time. Sometimes indeed it happens, but rely, that hunger attends in the fits of an inter-itting fever; yet generally when a fever is pre-nt, the appetite is aboliſhed, or at leaſt greatly eakened.

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[u] In Prognoſt. Charter. Tom. VIII. pag. 623, 624.

## S E C T. DLXXXVIII.

THE ſooner the lentor or ſtagnation c the blood in the capillaries can be removed (§ 577,) and the leſs time there is required to allay the irritation of the hea (§ 574.) ſo much ſlighter, ſhorter, and mor ſalutary will be the fever, and the reverſe The fever will therefore vary in proportio to the different degree and concurrence c both theſe.

We have under the preceding aphoriſm taken view of the bad effects to be feared from a feve and from whence we may form a judgment o what good may be expected therefrom, and wha general prognoſis is to be formed in fevers. W come now to conſider thoſe from whence we ma preſage the magnitude, duration and event of fever.

It was ſaid at § 577. that the humours ſtagnate in the extremities of the veſſels in the beginning o every fever, and at the ſame time there was a cauſ irritating the heart. This obſtruction or ſtagnation formed in the extremities of the ſmall veſſel impeding the free courſe of the blood throug them, is here underſtood by the general term lentor, from whatever cauſe it may proceed, eithe from a fault in the humours, veſſels, or both together. If now this lentor by the increaſing forc of the circulation in the heat of a fever can b eaſily reſolved, and at the ſame time if the cauſ irritating the heart is ſuch as will either ſpeedil ceaſe of its own accord, or may be eaſily conquer

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ed by the fever itſelf, it will be then both of a ſhort duration and ſalutiferous. This will better appear by example: if a fever ariſes from too much exerciſe of body, and the blood in the mean time does not acquire an inflammatory thickneſs, ſuch a fever will be cured in a little time by reſt, diluents and a thin diet. For the irritating cauſe in this caſe is chiefly the venal blood urged with a greater celerity and impetus towards the heart; but by reſt of body this irritation ſoon goes off. But a lentor of the blood occaſioned by too great a loſs of the more fluid parts in ſweats, and from a greater condenſation of the blood, by the increaſed action of the veſſels upon their contained fluids, is eaſily reſolved by reſtoring to the blood with diluent drinks what it had loſt; and by reſt of body the motion of the humour becomes more ſedate. But when by over exerciſe of body the blood has acquired an inflammatory tenacity, or if this quality pre-exiſted in the blood before the body was exerciſed with a violent motion, the lentor in ſuch a fever cannot be ſo ſoon reſolved, but it will continue longer and be more dangerous, becauſe of the inflammation and other bad ſymptoms which may be thence feared. Hence appears the reaſon why Hippocrates [w] ſays; *Corpora exercitata ac denſa citius a pleuriticis & peripneumonicis morbis pereant, quam non exercitata.* "That ſtrong "and exerciſed bodies are ſooner deſtroyed by "pleuritic and peripneumonic diſeaſes, than ſuch "as are not addicted to exerciſe." As now the fever varies according to the different degree of the lentor, ſo the ſame is alſo true with reſpect to the greater or leſs ſtrength of the irritating ſtimulus. A perſon who has a fever from taking too great

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[w] Coac. Prænot. N°. 398. Charter. Tom. VIII. pag. 875.

great a quantity of ſea-ſalt, has a very intenſe thirſt, but by plentiful drinking that ſtimulating ſalt is in a little time waſhed out from the blood. The ſame thing alſo appears by daily obſervation in thoſe who labour under a crapulary fever from drinking too much wine; for theſe ſeldom lie ill above a day or two. But when a fever is kindled by the ſtimulating poiſon or contagion of the ſmall-pox, it is very frequently fatal, and often extends itſelf for ſeveral weeks: For this ſtimulus is ſo far from being conquered by the fever, that by a wonderful property it converts almoſt all the humours of a healthy perſon into a like malignity with itſelf; for only the breath of a perſon ſick of the ſmall-pox will infect others that ſtand near, who have never yet had the diſeaſe: And inoculation of the ſmall-pox teaches us, that only one little drop of the variolous matter is ſufficient to propagate the ſame diſeaſe almoſt at pleaſure. It was remarked on another occaſion (ſee the comment to § 586. N°. 1.) that a girl after taking arſenic ſurvived indeed, but continued afflicted with diſeaſe for three whole years, and at length died tabid of a fever, the nature of which could not be underſtood by any one; for the incorrigible ſtimulus of the arſenical poiſon had ſo altered the whole body, that the diſeaſe which it produced could not be removed by any art.

From what has been ſaid it is evident that the moſt dangerous of all fevers ariſe when a great force of the irritating ſtimulus concurs together with a great lentor. It was demonſtrated in the commentary to § 97, that the ſtrongeſt people have the thickeſt blood, and the moſt inclined to concretion, and on the contrary that in weak people the blood is thin. And hence appears the reaſon why the healthieſt and ſtrongeſt youths ſo frequently periſh of the ſmall-pox, while on the contrary the weak and languid more frequently eſcape. The very worſt kind of the ſmall-pox which I ever ſaw, and accompanied with the moſt malignant ſymptoms, was in an atrabiliary woman; but her daughter being weak and but eight years old, had a very mild kind of the pox, of which ſhe was eaſily cured, even tho' ſhe derived the infection from her mother, being under no neceſſity to keep her bed throughout the whole courſe of the diſeaſe.

## SECT. DLXXXIX.

AND therefore a fever often exerts the power of a medicine, with reſpect to other diſeaſes,

In the comment to § 558, it was ſaid, that a fever is often one of the beſt cauſes of recovery, which is confirmed by the teſtimony of Hippocrates and others. Many more authors of the greateſt credit might be alledged to confirm the ſame truth; but I believe thoſe before mentioned will ſuffice, and it will be hereafter made evident in the hiſtory of acute and chronical diſeaſes, that a fever is often the beſt and only remedy by which the morbific matter lurking in the body can be conquered and diſcharged Nor will this be ſurpriſing, if we conſider what has been ſaid before of the effects of a fever, § 587. For when, for example, a perſon is afflicted with a regular quartan, during the whole time of the cold fit, which often continues for ſeveral hours, all the parts of the body both internal and external are violently ſhook, while the extremities of the arteries being contracted, repel back their contained humours into the larger trunks, as we are taught from the paleneſs of the external ſkin. If therefore any obſtructing matter be lodged towards the extremities of the veſſels, it will be thrown back into the larger, and in the mean time all the veſſels and viſcera are wonderfully ſhook and agitated by the febrile tremors. After this follows a heat gradually increaſing, and at the ſame time there is a violent and quick motion of the humours through the veſſels, which are now no longer contracted but pervious: and therefore all the fluids will act powerfully upon their containing veſſels, which will again react with a proportionable force upon the fluids they contain; whence follows an intimate mixture of them altogether, and an attenuation of ſuch as reſiſted the equable circulation, and at the ſame time there is often a happy reſolution of the moſt obſtinate obſtructions, provided they have not yet acquired the irreſolvable nature of a ſcirrhus. By all theſe means fevers often cure the moſt difficult diſeaſes, the gout, palſy, apoplexy, *&c.* which are inflexible to the beſt artificial remedies. For the ſame reaſon perhaps it is that cold baths prudently applied are often ſo uſeful in the moſt ſtubborn diſeaſes; for by the cold diffuſed thro' the body it is ſhook and trembles almoſt as in the beginning of fevers; and when the warmth of the body has overpowered the external cold, there is often a very conſiderable heat raiſed through the whole, as is experienced by thoſe who have been rubbing their hands with ſnow.

But it is alſo a common practice for phyſicians to excite a fever in the cure of diſeaſes, though they do not perhaps always think of it. How frequently and with how much ſucceſs have the ſtrongeſt ſpices been given, and in the largeſt doſes, for the cure of dropſies, which yet are deſervedly ranked among the remote cauſes of fevers, as was ſaid before at § 536. N°. 1. When paralytic patients make uſe of violent and long continued frictions, what do they more than haſten the return of the venal blood into the heart, and by irritating the ſame into more frequent contractions excite a fever (§ 573). The ſtrongeſt purges and antimonial vomits excite a fever while they are in action, and are often more ſerviceable by that means than by the evacuation they make; and therefore they are frequently adminiſtered with this view by ſkilful phyſicians for the cure of the moſt difficult diſeaſes. When a very ſtrong decoction of the wood Guaiacum is adminiſtered in the worſt diſeaſes of the bones, it proves of little ſervice, though drank in the largeſt quantities, unleſs an artificial Fever is alſo excited by the vapours of burning ſpirits of wine, ſo as to drive it with great rapidity through all the veſſels, and make it penetrate to the inmoſt receſſes of the bones (ſee § 529). When the pale maid, languiſhing with diſeaſe, does not make good blood from the ingeſted aliments, but has her body filled with white phlegm, which, as Galen prudently advertiſes us, is the half concocted aliment (ſee the comment to § 75 N°. 5.); therefore he would not have this evacuated, but retained and altered, that by the uſe of the moſt agreeable ſpices and ſteel a fever may be raiſed, which changes the half concocted humours into good blood; hence in a little time the roſe colour of her cheeks returns, and the weak limbs which ſhe before could hardly draw after her, ſhe is now able to exerciſe chearfully even with violent labour of body.

Even in the cure of ſlow fevers which continually prey upon the body without any remiſſion, and in which there is no place either for aliment or medicines, Celſus[x] thinks that nothing remains but for the phyſician to change the diſeaſe. *Sæpe igitur ex aqua frigida, cui oleum ſit adjectum, corpus ejus pertractandum eſt; quoniam interdum ſic evenit, ut horror oriatur, & fiat initium novi motus, exque eo, cum magis corpus incaluit, ſequatur etiam remiſſio.* "The "body is therefore to be frequently bathed with "cold water, with an addition of oil, becauſe by "that means ſometimes a ſhivering ariſes, and gives "birth to a new motion, from whence, when the "body has gained a greater heat, there follows a "remiſſion of the diſeaſe." It is ſufficiently apparent that by this artifice he endeavoured to change a continual ſlow fever into an intermittent; and a little after he orders three or four draughts of mead to be given in the fever itſelf, or to dilute the aliments well with wine, hoping by that means to increaſe the fever: And in the end of the ſame chapter he lays down the following as a practical rule: *Sed eſt circumſpecti quoque hominis, & novare interdum, & augere morbum, & febres accendere; quia curationem, ubi id, quod eſt, non recipit, poteſt recipere id, quod futurum eſt.* "But it is always the "part of a prudent phyſician, ſometimes to change "and increaſe the diſeaſe, or to kindle a fever, be"cauſe as the morbific matter does not admit of "a cure where it is at preſent, it may ſubmit to it "afterwards."

The phyſician therefore well conſults the intereſt of his patient, who conſiders the fever as an inſtrument of nature whereby ſhe ſubdues changes, and expels the cauſes of diſeaſes from the body, and who therefore ſo governs or moderates the fever, that it may neither be too ſluggiſh, nor yet deſtroy the body by its furious motion.

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[x] Lib. III. cap. 9. pag. 136.

## SECT. DXC.

HENCE the beginning, increaſe, height, decreaſe, criſes, changes and cure of a fever vary both in acute diſeaſes themſelves, and in every particular kind of fever.

Since therefore the lentor and irritating ſtimulus (§ 588.) are obſerved to act in various degrees in fevers, and as there is often a different concourſe of them both together, it is evident that the natural progreſs, ſymptoms and cure of the diſeaſe may be very different. But this is more particularly obſervable in acute fevers, which run through their courſe ſwiftly and with danger, (as was obſerved at § 564.); for in ſlow fevers the changes of the diſeaſe are not ſo ſudden, nor are they often ſo conſiderable, nor ſo much limited to a definite time. But in epidemical fevers, as they ariſe from the ſame common cauſe, there is obſerved a greater reſemblance throughout the whole courſe of the diſeaſe, even in different people, becauſe the whole variation in theſe depends entirely upon the conſtitution or temperature of the ſick; but in particular fevers, which ariſe almoſt from different cauſes in every perſon, a great variety is obſerved, ſince the ſeveral cauſes of theſe fevers, conſtitutions of the patients, and the concurrence of the different cauſes, with the variety of habits, may produce almoſt an infinite difference in the changes which happen from the beginning to the end of the diſeaſe; all which changes ought carefully to be obſerved through the ſeveral ſtages of the diſeaſe mentioned in the preſent aphoriſm.

Beginning. ] When any injury is perceived in the vital, natural, or animal functions, a diſeaſe is ſaid to be preſent, § 1; and therefore the beginning of the diſeaſe coincides with the firſt appearance of injury in the functions. But it is not every diſeaſe that is accompanied with a fever, and therefore the beginning of a fever is not to be eſtimated from every kind of injury in the functions. But ſince it is evident, from what was ſaid at § 571, that we can only know when a fever is preſent by the quickneſs of the pulſe; therefore the beginning of the fever will be when the quickneſs of the pulſe appears increaſed. But ſince it is of the greateſt moment to know the time when the fever begins, in order to make a juſt reckoning of the days, by which (as we obſerved before in treating of a criſis, § 587.) many things may be predicted in fevers, we ought therefore to uſe all our endeavours to avoid any miſtake in this computation. If a ſkilful phyſician attended the patient at the time when the fever began, this might eaſily be known; but this is very rarely the caſe, ſince the phyſician is hardly ever called till the diſeaſe has made ſome conſiderable progreſs, ſo that he is obliged to derive almoſt the whole of his knowledge concerning the beginning of the fever from the relation of the patient and his attendants. But ſince people uſually reckon the beginning of the diſeaſe from the time they are obliged to take to their bed; therefore this ought to be carefully enquired into to avoid fallacy. But even phyſicians have likewiſe ſometimes dated the beginning of the diſeaſe from the time of the decumbiture. Thus Aëtius[y] ſays, *Jam antea dictum eſt, quod principium totius morbi illud tempus dicimus, quando per morbi violentiam minuta hominis virtute, principium decubitus factum eſt.* "We have already obſerved, "that we call the beginning of the diſeaſe that "time when the patient's ſtrength being weakened by the violence of the diſeaſe, he firſt takes "to his bed." And in another place [z] he ſays, *Principium totius morbi vocare oportet illud tempus, quando homo febrire incepit adeò manifeſtè, ut continuitas corporis ipſe ſolvatur, neque amplius in publicum prodire valeat, & conſueta facere; atque ideo decubitu opus habeat. Non enim idem eſt, moleſte ſe habere, & febricitare. Capite enim dolens, aut moleſte ſe habens, et corpore gravatus valet ut plurimum in principiis conſueta peragere, donec prævalens ipſi morbus dejiciat virtutem.* "That the beginning of the whole diſeaſe ought to be called "the time when the patient begins to be ſo manifeſtly invaded by a fever, that the body can no "longer ſupport itſelf, nor appear in publick to "perform its accuſtomed buſineſs, and is therefore obliged to take to the bed. For it is not "the ſame thing to find one's ſelf out of order "and to have a fever. For a pain or uneaſineſs "in the head, with a heavineſs of the body, "uſually prevails firſt in the beginning, till the "diſeaſe itſelf, gaining ground, over-powers the "ſtrength." But to compute the beginning of the fever only from the time of the patient's decumbiture, may cauſe a great error, as Galen [a] well obſerves; becauſe ſome people being ſtronger or more able to ſuſtain injuries, or elſe being obliged to it by certain buſineſs, do not take to their bed ſo ſoon as others; while thoſe of a tender, weak and timorous diſpoſition, uſually take to their bed immediately upon every ſlight occaſion; and from thence he juſtly concludes, *Difficile eſſe morbi principium ſtatuere exacte, primum enim (morbi principium) inſenſibile eſſe: ubi jam decubuerit, non morbi, ſed decubitus eſſe principium.* "It is "difficult to aſcertain exactly the beginning of the "diſeaſe, becauſe the very firſt invaſion of the "diſeaſe is inſenſible; but the time when the pa-"tient takes to his bed is not the beginning "of the diſeaſe, but of the decumbiture." In order therefore to avoid error as much as poſſible, we are to take the middle way; namely, not to date the beginning of the fever from the time of the decumbiture, or from any injured function, ſince ſome diſorders may happen before the fever invades; and as Hippocrates well obſerves, ſpontaneous laſſitudes preſage future diſeaſes: nor yet did he determine the beginning of the fever from the ſigns of this or that injured function, as is evident from the hiſtories of his patients, given us in his books of epidemics. But yet it will not be eaſy for the phyſician to err in aſſigning the beginning of a fever, if he carefully attends to all that has been before ſaid, and enquires when it was that the patient perceived thoſe ſymptoms which we have pronounced to accompany every fever almoſt as yet known ariſing from an internal cauſe (§ 575); namely, a ſenſe of coldneſs, trembling, and ſhaking, *&c.* Nor will there ariſe any error in reckoning up the days of the diſeaſe, although we ſhould miſtake ſeveral hours as to the time of the beginning of the fever, as Galen [b] well obſerves, where he confutes the cavils of the ſophiſters; for the computation of the days is made not from the firſt hour, but from the firſt day of the fever, as we are told by Hippocrates [c] in the following words; *Obſervare igitur oportet primum diem, quo æger infirmari cæpit, cognito unde & quando principio: id enim noſſe præcipuum exiſtimatur.* "The firſt day therefore of the diſ- "eaſe upon which the patient begins to be ill, "ought to be remarked, that we may know from "whence, and at what time it had its beginning; "for the knowledge of this is reckoned of the "greateſt conſequence."

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[y] Lib. V. cap. 15. pag. 79.

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[z] Lib. V. cap. 5. pag. 78. verſa.

[a] De Diebus decretoriis Lib. I. cap. 6. Charter. Tom. VIII. pag. 459.

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[b] Galen. de Dieb. decret. Lib. I. cap. 6. Charter. Tom. VIII. pag. 459.

But how far the beginning of the fever may extend itſelf, is a different queſtion; for the times of a diſeaſe are uſually diſtinguiſhed into four, the beginning, increaſe, height, and declination. But the beginning of the diſeaſe, as Aëtius [d] well diſtinguiſhes, is variouſly underſtood. *Principium proprie dicitur impartibilis illa ac indiviſibilis primi morbi impetus invaſio, in qua victus homo decubuit. Principium etiam dicitur, quod per dilatationem nominant, quod uſque ad tertium diem extenditur. Principium quoque dicitur proprium atque neceſſarium maxime contingens, quod velut partem totius morbi principium nominamus, quod non cognoſcitur dierum numero, ſed exacerbationum qualitate, & concomitantium ſymptomatum lenitate; nam in incremento & morborum & ſymptomatum accidentium augmentum fit.* "The beginning, ſays he, is properly "ſaid to be that continued and indiviſible attack "which the diſeaſe firſt makes at its invaſion, and "in which the patient being overcome, is obliged "to take to his bed. The beginning is alſo ſaid "to be that which ſome call the dilatation or "ſpreading of the diſeaſe, extending itſelf even

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[c] De Victu acutor. Charter. Tom. XI. pag. 149.

[d] Lib. V. cap. 6. pag. 78. verſa. & Galen. De Criſib. Lib. I. cap. 19. Charter. Tom. VIII. pag. 404. 405.

" to the third day. The beginning is alſo called " that which we name the moſt neceſſary, proper, " and contingent part of the whole diſeaſe, which " is not known by the number of days, but from " the quality of the fits, and the mildneſs of the " concomitant ſymptoms; for in the increaſe both " the diſeaſe and the ſymptoms are more violent." And when the beginning is taken for a part of the courſe of the diſeaſe itſelf, we do not underſtand by it the indiviſible point of time, wherein health alters to diſeaſe, but a very conſiderable part of the whole diſeaſe itſelf, which Galen [e] thus limits, when he ſays, *Nam in univerſum oportet cognoſcere, quod, niſi manifeſtum apparent indicium coctionis, totum illud tempus intermedium eſt principium morbi.* " For it ought eſpecially to be " known, that unleſs there appears a manifeſt ſign " of concoction, that whole intermediate time of " the diſeaſe is to be reckoned the beginning." And when he illuſtrates this doctrine in the following chapter [f] by the example of a pleuriſy, he ſays, that if the pleuritic patient ſpits up nothing, but diſcharges urine which is clear and well coloured, and about the eleventh day begins to ſpit up ſomething, but which is liquid and crude, it is manifeſt to every one, that this whole time of the diſeaſe ought to be called the beginning. It is therefore evident that Galen carries the beginning of the diſeaſe to a greater extent than we generally do at the preſent time; for according to his doctrine, the beginning compriſes a conſiderable part of that time of the diſeaſe, which is not without reaſon at this day, called its increaſe. The beginning of the fever may be therefore ſaid to be that time when the actions indeed appear injured, but as yet the number of troubleſome ſymptoms do not ſuddenly increaſe or become more violent, as we ſometimes obſerve in continual fevers, which for the firſt days keep the patient almoſt in the ſame ſtate; but when afterwards the injuries of the actions increaſe, and the diſeaſe aſcends with greater velocity, that time may be called the increaſe of the diſeaſe, and ſo of the reſt.

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[e] De Criſibus Lib. I. cap. 17. Charter. Tom. VIII. pag. 401, 402. [f] Ibid. 402, 403.

But that theſe beginnings of fevers vary, is evident to all; for in the moſt acute diſeaſes this beginning has hardly any latitude, ſince the violence of the diſeaſe aſcends ſo ſuddenly, that the patient is immediately laid under the moſt extreme difficulties[g]. In other fevers, which advance more ſlowly, the beginning of the diſeaſe is often extended to ſeveral days. But altho' there may thus ſeem to remain ſome doubt or obſcurity, whereby we are not able exactly to diſtinguiſh the end of the beginning from the firſt appearance of the increaſe at all times; yet in the prognoſis and cure of the fever, no damage can follow from thence, becauſe in theſe ſuch an exact diſtinction of the beginning and increaſe ſeems to have little uſe.

Increaſe.] All that time of the diſeaſe, which comes betwixt the beginning and greateſt height or violence thereof daily advancing, is called the increaſe of the diſeaſe. During this period of time, the remaining health is diminiſhed, or the functions are more and more injured; and on the contrary, the ſymptoms of the diſeaſe increaſe, and other new ones ariſe. In this manner Hippocrates[h] ſeems to have underſtood the increaſe of the diſeaſe, when he ſays, *Sub morborum autem principia conſiderandum, an ſtatim vigorem habeant quod ex incremento manifeſtum eſt. Incrementa vero* ex

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[g] Hippocr. Aphor. 7. Sect. I. Charter. Tom. IX. pag. 12.
[h] Epidem. Lib. II. text. 6. Charter. Tom. IX. pag. 119.

*ex morborum circuitibus, ex quibus etiam judicationes ſe manifeſtant; itemque ex his, quæ per circuitus fiunt, exacerbationibus, ſi celerius accedant, aut non: ſi diutius durent, aut non: ſi majores fiant, vel non.* "But in the beginning of diſeaſes we are to "conſider whether they immediately arrive to "their height; which is manifeſt from their in-"creaſe. But the increaſe of diſeaſes appears "manifeſtly from their progreſs; from whence "alſo the criſes ſhew themſelves, and alſo from "the exacerbations made in the courſe of the diſ-"eaſe, whether they happen ſwiftly or not, whe-"ther they are of long or ſhort duration, or if "they are violent or not." But, as was ſaid before, Galen would not have it be called the increaſe of the diſeaſe until there are manifeſt ſigns of concoction.

But it is to be well obſerved, that all thoſe ſymptoms which ſhew themſelves during the increaſe of the diſeaſe, do not proceed only from the cauſe of the diſeaſe, any further than as that acts together with the healthy actions that ſtill remain; for life irritated by the cauſe of the diſeaſe produces thoſe diſturbances (ſee § 573.) Hence Sydenham [1] prudently obſerves, that in the very worſt diſeaſes, the ſymptoms are ſometimes milder, than one would think agreeable to the nature of the diſeaſe; and this he ſays happens, *Quod natura, a primo morbi impetu quaſi oppreſſa & devicta non ſatis valida eſt, ut ſymptomata regularia, & magnitudini morbi conſona, exſerat; omnia vero phænomena prorſus ſunt anomala. Etenim perturbata œconomia animali, & quaſi diſjecta, febris exinde deprimitur: quæ, obtinente genuino naturæ ductu, vigere ſolet* "Becauſe nature "being in a manner oppreſſed and conquered by

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[1] In Schedula monitoria de novæ febris ingreſſu pag. 683.

“ the firſt attack of the diſeaſe, is not ſtrong enough to produce the regular ſymptoms agreeable to the magnitude of the diſeaſe; but all the appearances turn out perfectly irregular. For the animal œconomy being diſturbed, and in a manner dejected, the fever is therefore depreſſed, which uſually grows ſtrong when it takes place agreeable to the regular courſe of nature.” All this he confirms by a ſuitable inſtance in a young man, who was almoſt ready to expire, though the temperate warmth of the external parts made it difficult to perſuade thoſe who attended on him that he had a fever: but after opening a vein, the fever, which had been hitherto ſuppreſſed by too great a fulneſs, raged with ſo much violence, that he confeſſes he never ſaw any fever more intenſe. In ſuch a caſe, although there is really an increaſe of the fever preſent, yet almoſt all the ſymptoms are ſilent. But this latent force of the diſeaſe is well enough known to a ſkilful phyſician, when he ſees the patient's ſtrength more overpowered, than is agreeable to the time that the diſeaſe has continued.

But it is evident enough, that the increaſe of the diſeaſe muſt vary in fevers, as well in the celerity or quickneſs of its advancing, as in the diverſity and number of ſymptoms which accompanies the increaſe.

Height.] This is the moſt dangerous ſtage of the diſeaſe, becauſe the ſymptoms have been all increaſing during the progreſs of the diſeaſe, and are now the moſt numerous and violent; whence it is called ἀκμὴ, the height or ſummit: Hippocrates[k] uſing the word to denote the higheſt pitch of any thing. This time of the diſeaſe is limited in the following manner by Aëtius[l], *Quum exacerbationes*

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[k] De priſca Medicina cap. 7. Charter. Tom. II. pag. 159.
[l] Lib. V. cap. 17. pag. 79.

*ſtatum acceperint, & ſimiliter per omnia conſequenter contigerint, concomitantibus ſymptomatibus neque detractis neque additis, tunc in vigore morbus eſſe dicatur. Vigor enim vehementiſſima totius morbi pars eſt.* "When the fits have acquired their height, and "conſequently are equally diffuſed throughout the "whole, without any decreaſe or diminution of the "concomitant ſymptoms, then the diſeaſe is ſaid "to be in its height or vigour; for the vigour or "height is the moſt violent part of the whole diſ"eaſe." Hippocrates[m] alſo expreſſes this with his uſual and juſt brevity, when he ſays, *Circa principia (morborum) omnia imbecilliora; at circa vigores omnia vehementiora.* "About the begin"ning of diſeaſes every thing is weaker; but to"wards the vigour or height every thing is more "violent." During this vigour of the diſeaſe the conflict betwixt the ſame and nature is carried on almoſt upon equal terms with the greateſt violence, 'till nature either conquers the diſeaſe, or is herſelf thereby conquered; and therefore at this time thoſe great diſturbances uſually happen, and are followed with manifeſt criſes, as was ſaid before in the comment to § 587. But ſometimes after this ſtage the force of the diſeaſe being gradually broken, health returns even without any apparent evacuation or tranſlation of the morbific matter; and in this caſe the diſeaſe is ſaid to be reſolved, as we explained by ſeveral inſtances under the aphoriſm before cited. But as this greateſt violence of the diſeaſe does not conſiſt in any ſingle point of time, but is ſometimes extended to one or two days, during which the ſymptoms of the diſeaſe neither increaſe nor diminiſh, therefore it is properly called the ſtate, becauſe the diſeaſe ſeems to ſtand in the ſame condition. During this time of the diſeaſe, the ancient phyſicians never diſturbed the body either by diet or medicines, but carefully attended to which way nature inclined, or at what alteration ſhe aimed, whether to throw off the morbific matter by excretions, or to depoſit the ſame upon ſome particular part, that they might be thence directed what was neceſſary to be done. Hence Hippocrates [n] adviſes, *Incipientibus morbis, ſi quid movendum videatur, move. Vigentibus autem, quietem agere præſtat.* "That if any thing ſeems neceſſary to be "removed in the beginning of diſeaſes, it ſhould "be done without delay. But that when diſeaſes "are in their height or vigour, it is better to do "nothing." And again [o] he adviſes: *Quum morbus in vigore fuerit, tenuiſſimo uti victu neceſſe eſt.* "That "it is neceſſary to uſe a very thin diet, while the "diſeaſe is in its vigour."

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[m] Aphor. 30. Sect. II. Charter. Tom. IX. pag. 73.

But alſo that the ſtate or height of a diſeaſe varies according to the magnitude, duration and different event, is ſufficiently apparent.

Decreaſe.] During this time of the diſeaſe, as Aëtius [p] well obſerves, every thing runs contrary to what was obſerved in the increaſe; for the general ſymptoms of the diſeaſe are leſſened, and the patient more eaſily ſupports the diſorder, even though it has often greatly weakened his ſtrength; and on the other hand every thing that remains of health daily increaſes. It is therefore evident that the greateſt danger that life is in during an acute fever, is paſt when the diſeaſe is in its decline. Hence Galen [q] will have it, that there is no danger of death after the height of a diſeaſe; and if ſome periſhed after this time of the diſeaſe, it was either through the errors of themſelves, or of the

phyſicians:

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[n] Aphor. 29. Sect. II. ibid. pag. 72.

[o] Aphor. 8. Sect. I. ibid. pag. 13.

[p] Lib. V. cap. 18. pag. 79.

[q] De Criſibus Lib. III. cap. 5. Charter. Tom. VIII. pag. 436.

phyſicians: for, ſays he, *Ubi enim natura ſuperior evaſit, & debellavit, & reſtitit vehementiori morbi conatui, & quæ infeſtabant, expugnavit, fieri non poteſt, ut poſtea ſuccumbat.* "When nature has "once become ſuperior, has fought and reduced "the more violent attempts of the diſeaſe, con"quering that by which ſhe was oppoſed, it is "then not poſſible for her to be afterwards capti"vated." But yet, as we ſhall explain hereafter, the fever has ſometimes introduced ſuch an alteration in the ſolid and fluid parts of the body, that even after its violence is over, new diſeaſes follow, to the force of which the patient is ſometimes obliged to ſubmit. But in that caſe, properly ſpeaking, the patient is not deſtroyed by the fever, which long ago ceaſed, but by another diſeaſe.

But fevers do not always in this manner gradually decreaſe after their height; for ſometimes in the greateſt vigour of the diſeaſe there are criſes, which entirely diſcharge all thoſe parts, which were either the cauſe of the diſeaſe itſelf, or which have been ſo altered by the diſeaſe as to be repugnant to the laws of health; in which caſe nothing remains in the body capable of continuing the diſeaſe, ſo that only a weakneſs remains from the preceding diſorder. This has been well obſerved by Aëtius[r], namely, that in ſuch caſes the declination of diſeaſes does not become manifeſt to the ſenſes, nor is it of any uſe then to enquire after it; for it is ſufficient that we know the diſeaſe is faithfully, ſecurely, and perfectly removed.

But ſince in fevers, which run through all theſe ſtages, the declenſion of them is uſually proportionable to their increaſe, which we have proved to be various in different fevers, it is therefore evident that the ſame will hold true with reſpect to their decreaſe.

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[r] Lib. V. cap. 19. pag. 79.

Theſe are the four times or ſtages which we meet with in all diſeaſes, if the malignity of the diſeaſe, or the weakneſs of the patient do not occaſion death, either in the increaſe or height of the diſeaſe; or if a perfect criſis happening in the height of the diſeaſe does not prevent its future declenſion.

Criſes.] Concerning the criſis we treated before in the comment to § 587. But this is obſerved to vary in different fevers, both with reſpect to the time in which it happens, or in its being good or bad, perfect or imperfect, made at one or at ſeveral times, and by one or ſeveral emunctories at the ſame time, or elſe by tranſlation without any evacuation, *&c.*

Changes.] For a fever is very often changed into another diſeaſe either of the ſame nature or of a very different kind. Thus continual fevers are often converted into intermittents, and on the contrary intermittents are often changed into continual fevers. We likewiſe obſerved that the ſolid and fluid parts of the body often receive ſuch an alteration by the fever, that when this is over another diſeaſe follows inſtead of health; concerning which we ſhall treat more at large in the comment to § 593. But theſe changes happening in fevers are very different in proportion to the cauſe, violence, duration, method of cure, *&c.* as for example very different alterations follow a fever, excited by the contagion of the ſmall-pox, from thoſe which are obſerved in the meaſles; and the changes in a putrid ſynochus are very different from thoſe in a ſimple continual fever. Thus lingring fevers often terminate in abſceſſes, as Hippocrates [s] has obſerved; and Sydenham laments the raiſing of a fatal peripneumony by the uſe of too hot a regimen in thoſe afflicted with the meaſles, *&c.*

Cure.] From what has been ſaid it is alſo very apparent that this muſt be very different, and we ſhall ſtill make it more evident hereafter, by what we have to ſay concerning the cure of fevers.

## SECT. DXCI.

A Fever terminates either in death, another diſeaſe, or in health.

We come now to conſider the nature and number of the ways in which a fever terminates. But it will immediately appear that it muſt be in one of the three mentioned in the text. For either the patient ſurvives the fever or not; if he ſurvives, either the integrity of the vital, animal, and natural functions are reſtored, *i. e.* health is recovered, or elſe there will afterwards ſome injury remain in ſome of thoſe functions after the fever is ended, and this is a diſeaſe (ſee § 1.); and therefore in this laſt caſe the fever may be juſtly ſaid to terminate in another diſeaſe.

But it will be of the greateſt uſe for us to attend carefully to all the ways of terminating a fever, that ſo we may learn how far by art, as hitherto known, aſſiſted by proper remedies, one may avoid or remove thoſe things by which a fever tends either to death or other diſeaſes; and on the contrary, how far we can promote thoſe ſalutary endeavours of nature and art by which the fever may be governed and obliged to terminate in health.

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[s] Aphor. 44. Sect. IV. Charter. Tom. IX. pag. 163.

## S E C T. DXCII.

A Fever terminates in death either from a deſtruction of the ſolids by too great violence, or from ſuch a depravity of the humours that they obſtruct the vital veſſels, or elſe hinder thoſe actions by which new humours ought to be prepared and put in the place of thoſe which are conſumed. Hence inflammations, ſuppurations and gangrenes following from fevers in the vital viſcera, in the heart, lungs and cerebellum, or aphthous ulcers in the firſt paſſages, frequently prove the cauſe of death from a fever.

Death is when the heart is perfectly at reſt (ſee the comment to § 1.); but for the heart to continue in motion requires a flux of the ſpirits from the cerebellum by the cardiac nerves to the heart; and alſo for the heart to receive the blood from the veins, and the next moment to expel it into the arteries; and therefore a ſound ſtate of the veſſels and a perviouſneſs of the veſſels are required for the continuance of life. When therefore the continuity of the veſſels is deſtroyed by a fever, and the humours ſo depraved as to be impervious, then death follows unavoidably, as the effect of a fever. But ſince life cannot be ſuſtained without a reſtitution of thoſe humours which are loſt or conſumed; therefore, if that reſtitution is obſtructed by a fever, death muſt alſo follow. Let us now therefore ſee how each of theſe effects may be produced by a fever.

From a deſtruction of the ſolids by too great violence.] So long as we are in health the ſides of our veſſels ought to be firm enough to ſuſtain, without breaking, the impulſe of the humours, by which the circulating juices are urged on through the veſſels. For ſince the humours are moved through converging arteries, they muſt of neceſſity act with a great force upon their ſides. If now the impetus of the humours through the veſſels are increaſed, while the ſtrength of their ſides remains the ſame, it is very evident there will be danger of breaking their cohesion or continuity. The larger arteries indeed can bear a great force without burſting; but the final extremities of the ſanguiferous arteries, which yet are the largeſt among the ſmalleſt veſſels, are much finer than a hair, and yet through theſe fine and tender extremities of the arteries are the humours moved often with a force very greatly increaſed in fevers; whence it is apparent that theſe tender ſolids muſt be in great danger of breaking by the increaſed force of the humours in a fever. But the very fine veſſels of the lungs and arteries of the encephalon, having depoſited their thick callous tunics, afford very little reſiſtance; whence the very ſoft pulp of the brain and cerebellum, which is intirely vaſcular, may be much the more eaſily deſtroyed. Practical obſervations frequently demonſtrate that the ſanguiferous arteries, which are much ſtronger than the ſerous or lymphatic, may burſt by the violence of a fever. The moſt acute fever, which ſometimes precedes or accompanies the eruption of the ſmall-pox of the worſt kind, is often attended with a violent hæmoptoe or ſpitting of blood from a rupture of the pulmonary veſſels by the too great violence; or elſe bloody urine attends from the ſame injury in the kidneys; and Sydenham [t] ingenuouſly confeſſes, that he was never able to ſave thoſe patients in which theſe ſymptoms happened, and that ſuch frequently periſhed in the very worſt ſtage of the diſeaſe before the eruptions came out. Hence Hippocrates [u] ranks fevers among thoſe cauſes by which the ſmall veſſels in the lungs may be ſtretched and broke open. If we alſo conſider at the ſame time while the motion of the blood is increaſed, that the ſalts and oils of our humours are rendered more volatile and acrid, it will be very apparent that thus the tender ſolids will be in ſtill greater danger of being deſtroyed: but this laſt will be from a fault in the humours, concerning which we ſhall ſpeak next.

Or from ſuch a depravity of the humours that they obſtruct the vital veſſels.] In treating of the effects of a fever (§ 587.) it was ſaid, that in this diſorder the moſt liquid parts of the humours were expreſſed, and the reſt thickened; and thus the humours becoming impervious muſt occaſion obſtructions. But if this happens in the vital veſſels (which are here underſtood to be thoſe through which a free motion is abſolutely neceſſary to continue life), namely, thoſe of the lungs or cerebellum more eſpecially; in that caſe death muſt follow in a ſhort time from the fever. But ſince the inſpiſſated humours are obliged to paſs through the ſmalleſt veſſels of the lungs and encephalon, therefore the tenacity or imperviouſneſs of the humours in fevers uſually appears moſt in theſe parts by ſuch ſigns as manifeſtly demonſtrate that the office of theſe viſcera is diſturbed. For a violent fever never continues long without being followed with a difficult reſpiration and delirium. Hence Hippocrates[w] ſays of an ardent fever, *Plerumque velut ad pulmonis inflammationem tranſmutatur, & delirat.* "That generally it changes, as it were, to "an inflammation of the lungs, and the patient "becomes delirious." And in another place, *Quibuſcumque in febre non intermittente ſpirandi difficultas fit, & delirium, lethale*[x]. "That a difficulty of breathing and delirium in all fevers not "intermitting is a fatal ſign." On the contrary he obſerves to us, that an eaſy reſpiration has a great influence towards health in all acute diſeaſes accompanied by a fever, and which terminate in forty days[y]. Nor does Hippocrates condemn a delirium only, becauſe the humours are ſo depraved that they cannot paſs through the veſſels of the encephalon; but he likewiſe eſteemed ſlighter evils as mortiferous, and of the worſt preſage when they denoted a delirium from this cauſe, ſuch as catching at imaginary flies, pulling off the bedcloaths, lifting up the hand before the face, *&c.*[z] But by what ſigns the violence of the fever may be known to be ſo great that we may reaſonably fear the ſymptoms, will be declared hereafter in the comment to § 609.

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[t] Sect. III. cap. 2. pag. 197. & in Diſſertatione Epiſtolari, pag. 444. [u] De internis affectionibus, cap. 1. Charter. Tom. VII. pag. 638.

Or hinder thoſe actions by which new humours ought to be ſupplied in the place of thoſe conſumed.] As far as we know, there is not any additional or new matter mixed with the blood, but what is received by the veins which open with very numerous and minute mouths throughout the external and internal ſurfaces of the body, and abſorb the liquors which are contiguous unto them. But ſince the motion of the humours through the veins is from the apex towards the baſis, ſo that the abſorbed liquors taken up by the minute venal mouths continually paſs from a ſmaller to a larger capacity, therefore in the veins there can be no danger of an obſtruction from a vice in the moving fluid; for whatever is ſmall enough to be able to paſs through the ſmalleſt extremities of the veins, may very eaſily paſs on through the reſt of the venal courſe (ſee what has been ſaid before at § 119.) But an external compreſſure of the adjacent parts, and a contraction or drineſs of theſe very fine abſorbing orifices, may hinder the humours from being taken into the ſmall veins. For as we have often ſaid before, there are innumerable arterial orifices which open throughout the whole external and internal ſurface of the body, through which there is a very ſubtle dew or vapour continually exhaled, which among other uſes ſerves to warm and moiſten the parts. If therefore the moſt fluid parts of the humours are exhaled by the too great violence of the fever, while the reſt of them are inſpiſſated, by that means the free courſe of the humours through the exhaling veſſels will be impeded; and thoſe veſſels, being diſtended by the impervious liquid, will be ſwelled by the force of the humours urging behind, ſo as eaſily to compreſs the adjacent abſorbing veins, which are always proportionably thinner than the arteries. Beſides this, as the exhaling moiſture is intercepted in its exhalation from the obſtructed arteries, the ſmall venal mouths muſt be conſequently dried up, and by that means all entrance will be denied to any new humour. This is the lamentable condition of thoſe afflicted with an ardent fever; for the tongue, the fauces, and all the internal parts of the mouth are extremely dry, when the voice becomes ſqueaking, and the ſwallowing often impractipracticable from the drineſs of the parts, while the whole ſkin is alſo rough and ſcaly. Hence the drinks taken in do not enter the blood, but run through the bowels, partly for the reaſon before mentioned, and partly becauſe the bowels are continually ſtimulated with the bile corrupted in the fever; and therefore Hippocrates [a] juſtly eſteems it a fatal ſign for a profuſe flux of the bowels to attend in an ardent fever. Theſe diſorders will be increaſed when the extremities of the exhaling arteries, diſtended by the impervious fluid, are ſo urged by the force of the humours behind, as to entirely prevent the paſſage of the vital fluid, whence they often become gangrenous, and turn into a very dry and thick cruſt, with which the whole ſurface of the tongue, internal parts of the mouth, fauces, æſophagus, ſtomach, and inteſtines are covered; and thus all entrance is denied to liquors by theſe ways. This appears evidently in thoſe who recover from theſe dangerous diſeaſes; for then theſe cruſts ſeparate like an entire ſkin from the tongue and other parts; and I have frequently obſerved the like ſloughs diſcharged by ſtool, which is an evident ſign that the internal parts had been affected in the like manner. Hence appears the reaſon why Hippocrates ſays, that all thoſe who die of an ardent fever periſh with drineſs; (ſee the comment to § 100.) for the moſt fluid parts are exhaled by the increaſed motion of the humours, while the loſs of them cannot be ſupplied, as the paſſage is intercepted for the entrance of new liquors.

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[w] De Morbis Lib. II. cap. 25. Charter. Tom. VII. pag. 576. & de Affectionibus cap. 3. ibid. Pag. 623.

[x] Aphor. 5. Sect. IV. Charter. Tom. IX. pag. 167.

[y] Prognoſtic. Charter. Tom. VIII. pag. 608.

[z] Ibid. pag. 606.

Hence inflammations, ſuppurations, *&c.* ] Since the natural humours may be thus depraved by a fever, ſo as to obſtruct the vital veſſels, it is no wonder that an inflammation ſhould ariſe from a fever, as the cauſe: but when an inflammation is raiſed, the ſeveral conſequences of it may follow, namely a ſuppuration and gangrene. But that all theſe may take place in the viſcera is evident from what was ſaid before in the comment to § 374, and 423. But if the vital viſcera are ſeized with theſe maladies from a fever, death generally follows in a little time.

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[a] Coac. Prænot. N°. 130. Charter. Tom VIII. pag 858.

Concerning the aphthæ which frequently follow continual fevers, we ſhall treat hereafter under a particular head. It is ſufficient to remark here, that often the whole tract of the primæ viæ is ſpread over with very thick cruſts of this kind, ſo as to intercept entirely all ingreſs of new humours to the blood, and by that means deſtroy the patient.

## SECT. DXCIII.

A Fever terminates in another diſeaſe when it has injured the veſſels by its too great violence or motion, and diſſipating the more fluid parts; or when by its too weak action its force is not ſufficient to attenuate or reſolve the febrile coagulum or obſtructing matter; or when it depoſits the critical matter upon ſome obſtructed, dilated, or ruptured veſſels: hence proceed red ſpots, puſtules, eryſipelas, meaſles, ſmall-pox, phlegmons, buboes, parotids, abſceſſes, gangrenes, mortifications, ſcirrhi, *&c.*

We come now to conſider how a fever may terminate in another diſeaſe; but this happens either through the injury offered by the fever to the ſolids or fluids, or elſe when that which excited the fever is thereby indeed altered, but not perfectly concocted nor expelled from the body, wherein it ſtill continues to diſturb the health: or laſtly, when the humours changed by a fever are depoſited upon ſome particular part, and there excite new diſeaſes; but each of theſe deſerves to be conſidered apart.

By weakening or injuring the veſſels with too great motion.] We have already ſeen under the preceding aphoriſm, that the veſſels may be deſtroyed by the violent impulſe of the humours increaſed by a fever; whence it is evident that the ſame cauſe in a leſs degree may over-ſtretch the ſides of the veſſels, ſo as to weaken them without diſſolving the continuity of their parts. For, as we ſaid before at § 26, the capacity of the veſſels is meaſured in a ratio compounded of the force of the impelled humours directly, and of the reſiſtance of their ſides inverſely. If therefore the momentum of the impelled fluid is increaſed while the firmneſs of the ſides of the veſſels continues the ſame, the capacity of the veſſels muſt of neceſſity be dilated. But the humours impelled by the force of the heart into the converging arteries, not only cauſe their ſides to recede from the acceſs of the canal, but alſo elongate the ſame veſſels. This I have ſeen evidently, as I have obſerved before upon another occaſion, when the great toe being cut off by one blow with the chiſſel, the elongated artery projected itſelf beyond the even ſurface of the wound at each ſyſtole or pulſation of the heart. The ſame is alſo confirmed by the obſervation that young people recovering after acute diſeaſes, are often found to have gained conſiderably in their height within the ſpace of a few weeks. The ſides of the veſſels are therefore diſtracted or ſtretched in a fever, as well longitudinally as laterally, which will leſſen the coheſion of the ſolid parts, as we proved in the commentary to § 25, N°. 3. from which cauſe alone an infinite number of diſorders may follow, as we obſerved at § 26. For all the aſſimilation of the ingeſted aliments is, in a great meaſure, owing to the action of the ſolids upon the contained fluids, and all the ſecretions and excretions require a determinate amplitude of the veſſels for them to be carried on agreeable to the laws of health. Hence it is that we ſo frequently obſerve dropſies, rickets, cacochymy, *&c.* follow after fevers of long continuance from too great a weakneſs of the ſolid parts.

And diſſipating the more fluid parts inſpiſſates the reſt.] This effect of fevers was proved before in the comment to § 587, and under the preceding aphoriſm it was ſaid, that death followed if the inſpiſſated tumours obſtructed the vital veſſels in the lungs or cerebellum. But if the ſame effect, following from the ſame cauſe, happens in other viſcera, whoſe integrity is not immediately required to continue life but only to health, then the fever terminates not in death but another diſeaſe. Hence ſo frequently ariſe the very worſt obſtructions in the liver, ſpleen, *&c.* after fevers have been of long continuance or ill treated, which give riſe to the moſt obſtinate chronical diſeaſes, as will appear hereafter.

Or by its too weak action is not able to reſolve the febrile coagulum.] In the comment to § 558, it was ſaid, that a fever is that inſtrument of nature, by which ſhe endeavours to conquer and change, or expel from the body whatever reſiſts the equable circulation of the humours. But as ſometimes this febrile motion being raiſed with too great violence, deſtroys the ſolids, and depraves the fluids, ſo as to occaſion death in the manner deſcribed before under the preceding aphoriſm; but on the contrary, this febrile motion is ſometimes ſo languid and ſuffocated, either from the natural weakneſs of the patient, or from the perverſe method of treatment, that it is not able to remove the obſtacles, or reſolve the coagulum making the material cauſe of a fever in the body: in that caſe the fever ceaſes, but health does not return, becauſe the matter which nature endeavoured to change by the fever, or expel by ſome emunctory, ſtill continues in the body unſubdued, and goes on to diſturb the functions. It is therefore a general indication in every fever ſo to moderate the force of it, that it may not, by deſtroying the ſolids and thickening the fluids, produce inflammations, ſuppurations, gangrenes, *&c.* nor yet to let it ſubſide ſo low as to be incapable of attenuating, changing, moving, and expelling the morbific matter, concerning which we ſhall treat more at large hereafter in the comment to § 609. Nor is it poſſible to inculcate ſufficiently this general and practical rule, which is of the greateſt moment; becauſe many have too ill an opinion of the name of fever, and believe that it ought ever to be weakened with all their power: when at the ſame time it appears from the works of the antients, and obſervations of the beſt phyſicians, that a fever often moſt happily cures itſelf, provided it be kept under a due regulation or moderate degree.

Or by depoſiting the critical matter, *&c.*] When that which by its coagulating force forms the material cauſe of a fever, is changed in its nature by the febrile motion, or expelled from the body after a critical diſturbance, health is then reſtored to the patient. But frequently this diſcharge does not happen in fevers, as was ſaid in the comment to § 587. But the critical matter is depoſited upon ſome part of the body, where it creates new diſeaſes by diſturbing the functions of the parts where it is lodged. But if this critical matter tranſlated to ſome part is ſo thin as to be able to flow freely through the veſſels, it is evident that then it will be neither accumulated nor ſtopped in the part. Hence it appears, that the particles of the critical matter ought to be large enough to obſtruct the veſſels, or elſe to enter the dilated orifices of the ſmaller veſſels by an error of place, (ſee § 118.) without being able to paſs thro' their extremities; or laſtly, it muſt be extravaſated by rupture of the veſſels into ſome natural or morbid cavity. By each of theſe three ways the critical matter may be collected in various parts of the body, and thus a fever may terminate in another diſeaſe, as will be more evident from what follows, ſerving to confirm this doctrine, and prove it by example. But as thoſe critical depoſitions appear moſt manifeſtly, which are obſerved to happen in the external parts, ſuch are therefore chiefly reckoned up here, altho' the like in every reſpect alſo happen in the internal parts, as we are taught from the diſſection of dead bodies, and as will be ſaid hereafter in the hiſtory of acute diſeaſes. But when the internal parts are thus affected, it is principally known from the injured functions of thoſe parts.

Red ſpots.] Theſe are ſaid to attend when the ſkin appears red in ſeveral parts of the body without any manifeſt tumor. But theſe happen when the ſmaller veſſels which naturally contain no red blood, do by an error of place admit the ſame, whence there is often the appearance raiſed of a ſlight inflammation in the cutaneous veſſels, when the matter, which ought to be carried off by inſenſible perſpiration, becoming more than uſually acrid, irritates the veſſels through which it paſſes. Hence it is that theſe are moſt often obſerved in fevers, where the morbific matter is evacuated by inſenſible perſpiration or ſweat. They are generally of no bad conſequence, and are eaſily cured only by diluent and cooling remedies. Thus Hippocrates obſerved [b] theſe ſpots, like flea-bites, about the ſeventh, eighth, and ninth day in fevers in the ſummer time, and only in women; and he adds, that none died who had theſe eruptions. But we ſhall hereafter treat of febrile eruptions under a diſtinct head.

Puſtules.] When an obſtruction and ſlight inflammation ariſes from the ſame cauſes alſo puſtules are produced, which are diſtinct from red ſpots, inaſmuch as they ariſe above the ſurface of the ſkin, and are elevated into ſmall tumors.

Eryſipelas.] What this diſorder is, we explained before in the comment to § 380. It frequently happens that a fever ariſes in a healthy perſon, without any previouſly known cauſe, and which terminates after one, two, or more days; but at the ſame time, large red ſpots appear on the external ſurface of the body, and which frequently ſpread themſelves very ſuddenly into a great compaſs. Thus I obſerved an eryſipelas ariſe in the arm of a woman on the fifth day of a fever, which, in a little time, ſpread up to the ſhoulders, and by degrees extended from thence through the neck and face, till it occupied the whole head. The fever immediately ceaſed, while this eryſipelas ſpread through the arm. Though there is no part of the body but what is at one time or other invaded with this diſorder,

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[b] Epidem. 2. Charter. Tom. IX. pag. 155.

order, yet it is moſt frequently obſerved in the face. This is by Sydenham called an eryſipelatous fever; and although for the moſt part the diſorder is uſually cured without danger, by a thin diet and cooling medicines, yet it ſometimes becomes gangrenous [c]. Hippocrates mentions a frightful eryſipelas which ſpread among the people, and with which the patient was ſo ſadly tortured, that the bones themſelves were laid naked, and the whole arm, fore-arm, leg, *&c.* had their ſoft parts deſtroyed by a ſpreading gangrene. But that this fever critically went off, when the eryſipelas appeared in the external ſkin, is likewiſe remarked by Sydenham [d] in another place; and at the ſame time it gives us a reaſon why Hippocrates [e] ſo much condemns an eryſipelas ſtriking in, and approves of its breaking out: for then a new fever is kindled when the eryſipelas ſtrikes inward, which is attended with great danger, leſt the diſorders ſhould then invade the brain, lungs, *&c.* It is alſo evident, that in theſe eryſipelatous fevers, the various event of the diſeaſe depends chiefly upon the parts which the eryſipelas raiſed by the fever occupies; for in external parts of the body there is ſeldom any great damage done by it, but that it muſt be extremely dangerous in the internal parts no one can doubt. Nor can art do much in this caſe to determine the critical depoſition outward; for there are no ſigns to diſtinguiſh this eryſipelatous fever, and although any one could foreſee it when epidemical, ſince the matter is uſually depoſited in various external parts of the body, yet one could have no certain ſign to point out the particular part to which the attractive or derivative medicines ought

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[c] Sect. VI. cap. 6. pag. 353.

[d] Idem Sect. II, cap. 2. pag. 136.

[e] Aphor. 25. Sect. VI. Charter. Tom. XI. pag. 261.

ought to be applied (ſee § 134.) The only remedy, that might perhaps be uſed in ſuch a caſe, would be to relax the whole external ſkin by a warm vaporous bath. From hence perhaps ſometimes the moſt fatal events ſuddenly happen in fevers, which could not be reaſonably expected either from their violence or malignity of the concomitant ſymptoms; namely, becauſe an eryſipelas ſeizes the membranes of the encephalon, and ſuddenly exciting a delirium, kills the patient. I well remember myſelf to have ſometimes ſeen ſuch caſes, and have thereby learnt not raſhly to accuſe other phyſicians either of unſkilfulneſs or negligence, who have in ſuch caſes ſometimes had the patient ſuddenly ſnatched out of their hands, when it was leaſt expected.

But that an eryſipelas may invade the viſcera is taught by Hippocrates [f], where he ſays it may be generated in the lungs, and reckons fevers among the cauſes of producing an eryſipelas in the lungs, and at the ſame time gives certain ſigns by which an eryſipelas in that part may be known. But he places all the hopes of a cure in that the eryſipelas may be thrown outward in two, three or four days time at moſt, without which he obſerves ſuch patients muſt periſh in a little time, from the whole ſubſtance of the lungs being rendered purulent and putrid. But it muſt be well remarked that the ſigns of this diſorder mentioned by Hippocrates denote indeed that an eryſipelas has already invaded the lungs, but do not ſignify that the eryſipelas is about to be formed: Whence again appears the difficulty of forming a prognoſis in theſe eryſipelatous fevers, and we ſhall hereafter ſay ſomething in confirmation of this, when we come to treat of a quinſy.

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[f] De Morbis Lib. I. cap. 8. Charter. Tom. VII. pag. 540.

Meaſles.] For the eruption of theſe is always preceded by a fever, and more eſpecially the regular kind of meaſles come out always on the fourth day; but in the anomalous ſmall-pox the eruption is made ſometimes ſooner, and ſometimes later [g]. In theſe diſorders it is alſo apparent that the morbific matter is by the fever determined towards the ſurface of the body; and therefore there is no great danger if the meaſles occupy only the exterior parts, and the patient is not treated with the hot regimen; but when a delirium or dyſpnœa give reaſon to ſuſpect that the like diſorder invades the encephalon or lungs, the caſe is then often doubtful and dangerous.

Small-pox.] What has been ſaid appears above all the moſt manifeſt in this diſorder. For when the received contagion is become active in the body, it kindles a fever, in which a moſt ſkilful phyſician may eaſily be deceived, unleſs the ſmall-pox are at that time epidemical, becauſe the generality of the ſymptoms are like thoſe in common to other acute continual fevers. After this fever has continued two, three or four days, there is the appearance of ſpots like flea-bites in different parts, whereupon all the ſymptoms abate, and in the diſtinct ſmall-pox the fever quite ceaſes, ſo that the patient has no more ſuſpicion of danger. The fever then ceaſes which aroſe from this wonderful and ſtimulating contagion; and although in the mildeſt kind of the ſmall-pox the patient then ſeems to be recovering his health, yet in reality another diſeaſe follows when the variolous poiſon is not ſufficiently conquered by the fever, nor expelled from the body; but here by a critical depoſition it is ſent towards the ſurface of the body, where

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[g] Sydenham Sect. V. cap. 3. pag. 292.

where it firſt makes ſmall red ſpots, which are afterwards raiſed into puſtules, each of which are again converted into ſmall abſceſſes; and in theſe indeed the pus or matter is various, according to the different malignity of the diſeaſe, but always of that kind, that each drop of matter contains the ſame variolous poiſon, by which even the moſt healthy perſon may be infected with the ſame diſeaſe, as we are taught by inoculating the ſmall-pox. Hence it is evident that the fever raiſed by variolous contagion does neither conquer nor expel the virus or miaſmata, but on the contrary changes the moſt healthy humours of the body into a poiſon of the like nature, and then makes a critical depoſition of them towards the ſurface of the body.

Phlegmons.] What a phlegmon is, and how it differs from an eryſipelas, has been ſaid before at § 370. and 380. But in the ſame manner as an eryſipelas is thrown out of the ſurface of the body by the kindled fever, or elſe ſometimes invades the internal parts with the greateſt danger, ſo the ſame is alſo true of a phlegmon, as we are aſſured from daily obſervation in practice. In ſcorbutic people a fever is very often obſerved, which ceaſes after a day or two, depoſiting the febrile matter towards the legs, in which often ariſes a violent phlegmon, ſometimes degenerating into malignant ulcers, or even a ſpreading gangrene. I have even ſometimes obſerved a fever ariſe in the moſt healthy people without any previous obſervable cauſe, which fever has terminated after twenty-four hours, leaving a violent inflammation in ſome part or other of the body; but is not ſomething of the ſame kind obſervable in acute imflammatory diſeaſes? Certainly a pleuriſy ſeldom happens without being preceded by a fever, which fixes the inflammation among the intercoſtal veſſels; but the ſame carried towards the head might have excited a fatal phrenzy, as we often obſerve done, when the pain vaniſhing from the ſide without good critical ſigns, is followed by fierce ravings or a delirium. In inflammatory quinſies I have obſerved that a fever ariſes firſt, and that after a day or two the tonſils become ſwelled or inflamed, the fever immediately going off; but when this inflammation is once fixed in the parts now mentioned, the fever returns no more afterwards, if the diſeaſe is not malignant, and the inflammation itſelf afterwards diſperſes without being followed with a ſuppuration; for a violent inflammation and ſuppuration are always attended with a fever, as we ſaid before; but then ſuch a fever is different from that which firſt depoſited or fixed the inflammatory matter upon the affected parts; and this as much as the primary fever which attends in the contagious ſtate of the ſmall-pox, by which the morbific matter is determined towards the ſurface of the body, differs from the ſecondary fever, which accompanies and follows after the inflammatory and ſuppurating ſtate of the ſmall-pox.

It may be therefore aſked whether inflammatory diſeaſes do not more eſpecially differ from each other in regard to the part towards which the inflammatory matter is drove by the preceding fever? This indeed ſeems very probable, for the general curative indications are the ſame in all, and the only difference ariſes from the parts affected. Thus when a phlegmon ſeizes the leg after a fever is raiſed, prudent phyſicians are careful not to diſturb the depoſition of the matter in this place by neglecting to uſe either cooling, aſtringent, repellent or other medicines; and then they endeavour to cure the inflammation, either by diſperſing it, or promoting a mild ſuppuration. But when ſuch a mata matter as this is depoſited by the fever upon the brain, we ſtudy to derive the matter from thence by all the aſſiſtances of art, as ſoon as ever there is the leaſt reaſon to ſuſpect, either from the epidemic nature of the diſeaſe or the concomitant ſymptoms, that the morbific matter tends towards ſuch a dangerous part. If this derivation of the matter cannot be obtained, we endeavour to diſperſe the inflammation there ſeated by bleeding, and other moſt potent and cooling remedies; becauſe a ſuppuration in this part is univerſally allowed to be either fatal, or at leaſt always extremely dangerous. Perhaps this is what Hippocrates [h] would have us underſtand, when he ſays, *Dolores & in lateribus, & in pectoribus, & in aliis* (*partibus*) *an multum differant, perdiſcendum.* "We are to learn whether pains in the ſide and breaſt differ much from thoſe in other parts."

Now according as the phlegmon once raiſed occupies different parts, or makes a different termination, the fever again ends in other diſeaſes.

Buboes and parotides.] Namely when the inguinal or ſubaxillary glands are inflamed and ſwelled; as alſo thoſe large glands ſeated behind the ears. But concerning theſe we treated before in the comment to § 416.

Abſceſſes, gangrenes, mortifications.] Since from what has been ſaid before it is evident a fever ſometimes terminates in a phlegmon; it is alſo equally evident that when once a phlegmon is produced, all its conſequences or ways of terminating may follow; and therefore an abſceſs, gangrene, &c. may take place. But we ſometimes obſerve in fevers that a large quantity of true matter is depoſited ſuddenly upon ſome particular parts, from whence it has been diſcharged, although no inflammation preceded in thoſe parts, nor any ſigns demonſtrated that the matter lay before concealed in other parts, which might be taken up by the veins, and tranſlated and depoſited again upon others. This is what I have ſeveral times obſerved and wondered at, eſpecially in a woman who had got over the twentieth day in a continual fever; but when ſhe ſeemed to be on the recovery, and the diſeaſe was declining without any bad ſymptoms attending, ſhe ſuddenly began to complain of an obtuſe pain in each arm, when the day before there was nothing perceived amiſs in thoſe parts, which now upon a careful examination I perceived to contain a large quantity of ſome fluctuating humour under the integuments, which appeared not at all coloured, and being inciſed matter was diſcharged, and the abſceſs depurated and healed in a little time. But yet throughout the whole courſe of this diſeaſe I could not obſerve any marks of a topical inflammation or ſuppuration in any part of the body. I therefore believed that the material cauſe of the fever had been by the fever itſelf ſo changed and concocted, as to acquire a nature like that of pus or matter, though as yet it continued to flow through the veſſels with the reſt of the humours; and that afterwards this matter was depoſited ready formed upon ſome part, but not generated in the parts where it found was collected. There are certainly many paſſages in the antient phyſicians very much favouring this opinion. Hippocrates [i] tells us; *Quæcumque vero febris longior fiat, ſalutariter tamen decumbente homine, neque dolore detinente ob inflammationem aliquam, neque ob ullam aliam evidentem cauſam, huic abſceſſus cum tumore & dolore ad articulum aliquem, maximeque in inferioribus partibus exſpectandus eſt. Magis autem*

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[h] Aphor. 5. Sect. VI. Charter. Tom. IX. pag. 250.

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[i] In Prognoſt. Charter. Tom. VIII.. pag. 676, &c.

*autem oriuntur, & breviori tempore ejuſmodi abſceſſus, annis triginta junioribus. Suſpicare autem oportet ſtatim de abſceſſu in talibus, ſi viginti dies febris detinens ſuperet, &c.* "That whenever a fever is long, and keeps the patient lying in a fair way, without any pain or inflammation, or without any other manifeſt cauſe, in ſuch a patient we may expect an abſceſs with tumor and pain about ſome joint, and more eſpecially in the lower limbs. But abſceſſes of this kind ariſe larger or more commonly, and in a ſhorter time in thoſe who are under thirty years of age. But we ought always to ſuſpect an abſceſs in theſe caſes, if the patient ſurvives after lying twenty days ill of the fever, &c." And Galen [k] in a place which I have mentioned before upon another occaſion (§ 387.) tells us; *Putredo autem humorum, quæ fit in vaſis, ſimilis eſt illi, quæ fit in inflammationibus, & abſceſſibus, & aliis tuberculis.* "That the putrefaction of the humours made in the veſſels is like that which happens in inflammations, abſceſſes and other tumors." But he ſays there are two kinds of this putrefaction, and that from a mixture of theſe two ariſes a third kind, differing according to the mutual proportion of them with reſpect to each other. *Alterum nempe fieri, vincente natura; alterum veró devicta. Vincente quidem natura, uti in inflammationibus & tuberculoſis omnibus tumoribus, pus fit; in humoribus autem arteriarum & venarum illud, quod ſubſidet in urina puri analogum. Hæc autem putredo non ſimpliciter putredo eſt, ſed aliquid coctionis habet. Manente enim concoquente facultate vaſorum, putreſcens tunc humor ad talem alteratiomen deducitur.* "That the one of theſe happens when nature

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[k] De Febribus Lib. I. cap. 7. Charter. Tom. VII. pag. 15.

“ overcomes the diſeaſe; and the other when the “ diſeaſe overcomes nature: When nature overcomes the diſeaſe, there is a formation of matter “ like that which is made in inflammations, and “ as happens in all tumors; but that which “ ſubſides in the urine reſembles matter, when “ in the humours of the arteries and veins. But “ this kind of corruption is not ſimply a putrefaction, but a kind of concoction or digeſtion; “ for while the digeſtive or attenuating power of “ the veſſels remains, the corrupting humour is “ reduced to the ſtate above-mentioned.” But when this is analogous to matter, flows with the blood, and is diſcharged from it by urine, in that caſe the matter of the future abſceſs is expelled; and from thence the reaſon is evident why Hippocrates[l] ſays, *Qui urinas tenues & crudas mejunt multo tempore, ſique cætera, ut ſuperfuturis, ſigna ſint, illis abſceſſum ad loca infra ſeptum tranſverſum exſpectare oportet.* Et contra: *Quibus ſpes eſt ad articulos abſceſſum fore, liberat ab abſceſſu urina copioſa, & craſſa, & alba reddita*[m]. “ That in “ thoſe who void thin crude urine for a long “ time together, and eſpecially if there are other “ ſigns attending, one ought to expect that an abſceſs will happen to theſe in a part below the “ diaphragm. But on the other hand a plentiful “ diſcharge of a thick and white urine, frees thoſe “ from an abſceſs, which one might have expected “ to happen about the joints.”

But as in this manner a laudable matter may be formed when nature conquers, agreeable to the words of Galen; ſo on the contrary, when nature is overpowered, the worſt kind of corruption may follow; which being depoſited by the fever upon certain parts of the body, may indeed ſave the patient's life, and free him from the fever, but yet may occaſion a ſudden death of the parts where it is lodged: ſo that the fever then terminates in a gangrene or ſphacelus, without any previous violent inflammation of the parts thus affected, and only from a bare depoſition of a malignant matter thrown from the whole maſs of humours upon ſome particular part by the fever. See what has been ſaid concerning a gangrene and ſphacelus ariſing from this cauſe, in the comment to § 423.

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[l] Prognoſt. Charter. Tom. VIII. pag. 636. [m] Aphor. 74. Sect. IV. Charter. Tom. IX. pag. 184.

Scirrhi.] Although a ſcirrhus is generally formed by a ſlow collection of impervious matter about glandular parts, as we obſerved before in the hiſtory of it, yet in fevers there is often a ſudden depoſition of a like matter upon thoſe parts, cauſing tumors, which, unleſs treated with the moſt emollient and diſcutient medicines, often degenerate into irreſolvable ſcirrhi, as frequently happens in the buboes and parotides ariſing in fevers. In lying-in women a violent fever is often obſerved to ariſe ſuddenly, which ſeldom continues longer than a day or two; and then there is a hard tumor in the breaſts, which frequently turns to a ſcirrhus, unleſs ſkilfully treated when the fever goes off. Sydenham[a] has obſerved, *Quod nulla ſpes ſit abigendi febres autumnales, quæ teneram ætatem diu cruciarint, donec abdominis regio circa lienem præcipue indurari atque tumefieri cæperit: iiſdem enim gradibus, quibus hoc ſymptoma ſupervenerit, febris etiam fugam meditatur.* "That there "are no hopes of curing autumnal fevers which "have a long time tortured children, until the re-"gion of the abdomen begins to ſwell and feel "hard, more eſpecially about the ſpleen; for in

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[a] Sect. I. cap. 5. pag. 121, 122.

“ proportion as this ſymptom increaſes, the fever “ goes off.” He therefore obſerves, that we may from thence make a moſt certain prognoſtic that the fever is about to depart, and that thoſe tumors ſeem to the touch as if the viſcera contained ſome matter hardened into a ſcirrhus; and this chiefly in thoſe years when autumnal intermittents were epidemical, but that in other years theſe tumors only appeared to the touch like a flatulent diſtenſion of the hypochondria.

## SECT. DXCIV.

A Fever terminates in health, (1.) whenever the material cauſe is by the force of the fever itſelf ſubdued, diſſolved, rendered pervious, and expelled in the form of inſenſible perſpiration, while at the ſame time the blood recovering its equable circulation, it allays the violence of the fever. This is the way of terminating a fever by a reſolution, being almoſt the ſame in the whole body with that part which we before deſcribed in a particular part (§ 386.). But a fever again terminates in health likewiſe, (2) if the ſame matter of the diſeaſe is ſubdued, reſolved, and rendered pervious by the force of the Fever, but yet retains ſome quality repugnant to the equable circulation, and by ſtimulating the veſſels is expelled by ſome ſenſible evacuation thereby excited: hence it goes off by ſweat, ſpitting, vomiting, a diarrhæa, or by urine, happening after the concoction and height of the diſeaſe, uſually within fourteen days, a criſis being made.

As health is the reward promiſed by phyſic to the diſeaſed, and the termination of a fever in health without the intervention of any other diſeaſe is always the moſt happy and deſirable; it is therefore our intereſt to know and diſcover thoſe efforts of nature, by which ſhe endeavours to make a fever terminate in this manner: But a fever may end in health two ways, as when the morbific matter is ſo changed by the force of the fever itſelf, that being aſſimilated with the healthy humours, it may be freely moved through the veſſels without any diſturbance to the equable circulation, concerning which we ſhall treat in the next aphoriſm: or elſe the ſame morbific matter being ſubdued and rendered pervious by the force of the fever, is afterwards expelled out of the body, and this either by an inſenſible or a ſenſible evacuation, concerning which we are now to treat.

Every thing that degenerates (1.) from the laws of health either in the ſolid or fluid parts of the body, either preexiſting before the fever was raiſed, and being the cauſe thereof, or elſe in effect following from and after the fever, is uſually comprehended under the denomination of the material cauſe of the fever. For although it is repugnant for the effect to exiſt before the cauſe, and for that change which is made by the fever to be the cauſe of the fever itſelf; yet the depravity of the humours may by fever keep up the fever already excited and produced by another cauſe. For a fever therefore to terminate in health requires all the matter which is degenerated from its natural and healthy ſtate to be expelled from the body, or elſe to receive ſuch a change as will render it like the healthy humours.

Among the effects of a fever (§ 587.) we reckoned an attenuation of the reſiſting matter, a concoction of it, and a ſecretion thereof when concocted; and in the ſame place it was proved that the fever very often ſubdues that which reſiſted the equable circulation, and renders it fit to be expelled from the body by convenient outlets. When therefore a fever has ſubdued its material cauſe, and rendered it moveable, ſo that it may paſs through the ſmalleſt exhaling veſſels, it may then be expelled from the body under the form of inſenſible perſpiration joined with thoſe vapours which are naturally evacuated that way. But it is very apparent that when the febrile matter is reduced to ſuch a ſtate of tenuity as to be able to paſs through the ſmalleſt extremities of the exhaling arteries, there can be no danger of its obſtructing the other veſſels, nor of diſturbing the equable circulation. So that the humours will paſs very freely from the extremities of the arteries into the veins, and the increaſed velocity of the circulation will ſoon ceaſe, becauſe the arterial blood, which has hitherto moved too quick, now finding a free paſſage into the veins, will be continually retarded in its motion through them, as it always paſſes from a ſmaller to a larger capacity. But although the obſtacle which by its reſiſtance made the fever is thus removed, yet there may ſtill remain an irritating ſtimulus, from which alone alſo a fever might be raiſed in the moſt healthy body; as we ſaw before in § 586, where we enumerated the particular cauſes of fevers. For this reaſon it is added in the text, that a fever then terminates by this manner in health if at the ſame time it allays its violence; whether this be brought about by an expulſion of that, which by its ſtimulus raiſed the fever, or from the ſame matter being rendered unactive by the fever itſelf, ſo that it is no longer able to make any irritation.

But as inſenſible perſpiration is carried on every moment during health, without giving any uneaſineſs, therefore this will be the moſt deſirable emunctory to carry off the matter of the fever. But this way of curing a fever is very much like that of removing an inflammation by diſperſion or reſolution, concerning which we treated before at § 386: for there alſo the ſtagnant and concreted humours, being diſſolved and reſtored to motion, carried off the inflammation, which thing alſc takes place in the preſent diſorder. But, as we there obſerve, it is not every inflammation that is capable of being cured by reſolution, but only ſucl as have the humours mild, their motion ſedate and the obſtruction ſmall, &c. all which is likewiſe true with reſpect to curing fevers in this manner: for if the fever has diſſipated moſt of th thinneſt humours and inſpiſſated the reſt, or ha changed the healthy humours into a malignan morbid diſpoſition, it will be in vain to expect ſucl a mild termination of a fever in this manner int health; juſt as one would be deceived, if he expected to cure a violent inflammation accompanie with a great acrimony of the humours, at the ſam time when their moſt fluid and diluent parts bein conſumed, occaſions the moſt obſtinate obſtructions The antient phyſicians have therefore very prudently obſerved to us, (as we ſaid in treating of th criſis, § 587.) that only ſlight diſeaſes paſs off b reſolution, but the more violent come to a criſis i. e. they are removed by ſenſible evacuation which are often preceded or accompanied wit great diſturbances. Hence it appears with ho

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much injuſtice Helmont condemns the phyſicians, becauſe they could not cure all fevers in this manner; and he orders the patients, who have eſcaped from fevers by other methods, to return God thanks for giving them ſtrength to hold up as well under the weight of the means uſed by the phyſicians, as of the fever itſelf. For, ſays he, *Unica nimirum falce amputatur omnium febrium cauſa occaſionalis. Id remedium eſt ſudoriferum, quod incidit, extenuat, reſolvit, liquet, abradit, & ſimul abſtergit cauſam occaſionalem, ubicumque locorum ea demum exſtiterit. Eſtque univerſalis febrium medicina, diaphoretica quidem, inſenſibiliter, & citra ſudorem præfatos affectos patrans.* "The occaſional cauſe of all fevers can be extirpated only by one means, which is a ſudorific medicine that incides, attenuates, reſolves, melts, abrades, and at the ſame time abſterges the occaſional cauſe, in whatever part of the body it may lodge. And, indeed, diaphoretic medicines are univerſally a cure for fevers, producing their forementioned effects inſenſibly and without ſweats.[o]" This is good advice, provided it would be followed with the effects promiſed; but ſuch boaſters who pretend to ſecret medicines have always ſome excuſe ready, when they ſhould publiſh the means by which they can perform this. For, ſays he, *Non enim cuique Medico contingit adire Corinthum, nec licet profanare arcana Dei, qui horum diſpenſator manere voluit. Sat fuit Theoriam Medicam manifeſtaſſe*, &c. "It is not proper for every phyſician to be admitted into the deſigns, nor ought the ſecrets of God to be prophaned, as he will ever remain the diſpenſer of them. It is ſufficient that we have diſcovered the theory of phyſic, *&c.*[p]"

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[o] Helmont. De Febribus, cap. 14. pag. 775. N°. 7.

[p] Ibid. pag. 776. N°. 11.

But this doctrine, if ever any thing did, has certainly introduced moſt fatal errors, when phyſicians confiding therein, have endeavoured to cure all fevers with diaphoretics only, without being ſollicitous whether nature inclines that way or not; whereas, if they diſpoſed the febrile matter to be reſolved by ſuch diluents as attenuate moderately, without increaſing the febrile motion, the matter might be this way commodiouſly evacuated, and they would do no great injury: but when they attempt to do this by hot ſpices, volatile ſalts, &c. joined with heat of the air and bed-cloaths, they add fewel to the fire, and diſſipate the diluent vehicle of the blood, ſo as to throw the whole ſyſtem into diſorder. But it has been thought, that this method can be uſed in no caſe with greater reaſon, than in thoſe diſorders where nature uſually determines the morbific matter to be thrown off by the ſurface of the body, as in the ſmall-pox and meaſles, wherein ſome therefore endeavour to provoke a diaphoreſis by all the aſſiſtances of art: but with what unhappy events this is followed, may be ſeen in Sydenham, who with a laudable courage oppoſed himſelf almoſt alone to the torrent of this practice, and proved, by invincible arguments as wel as natural experiments, how extremely pernicious ſuch a method of cure is; and at length towards the latter part of his life, after having been upwards of thirty years employed in the obſervation of diſeaſes, he leaves poſterity the following piece of good advice[q]. *Quod nempe Diaphoreſis, proprie loquendo, naturæ ipſius ſit methodus, qua materiam febrilem foras protrudit, & præ cæteris maximè genuina ſit, quoties natura, ſuo relicta arbitrio, dictam materiam primum digerat; dein ritè coctam per cor*

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[q] Sydenham in Schedula Monitoria de novæ febris ingreſſu pag. 679.

*poris habitum blandè expellat. Quo tamen dato & conceſſo, ars nihilominus, quantumcunque naturæ imitationem præ ſe ferat, id ſaltem privilegii ſibi arrogare nequit, ut febribus per ſudores certo exigendis par ſit. Primo enim neſcit ars, quo pacto materia peccans ad expulſionem ſubeundam ritè præparanda ſit; nec ſi hoc ſciat, certa ulla habet indicia, quibus de hujuſmodi debita præparatione poſſit moneri. Unde etiam & tempus ciendo ſudori opportuniſſimum ignorari neceſſe eſt*, &c. “ That indeed a diaphoreſis
“ is, properly ſpeaking, the method of nature her-
“ ſelf by which ſhe diſcharges the febrile matter,
“ and is therefore beyond all others the moſt ge-
“ nuine excretion, as often as nature being left to
“ herſelf ſhall firſt concoct the febrile matter, and
“ afterwards gently expel the ſame from the whole
“ ſurface of the body. But this being ſuppoſed
“ and allowed, art ought not therefore, under any
“ pretence of imitating nature, to arrogate to itſelf
“ the privilege of curing fevers by ſweats, as the
“ beſt method. For in the firſt place art is not
“ acquainted with the proper means, by which the
“ offending matter is to be prepared in order for
“ expulſion; nor if it knew this, are there any
“ ſigns whereby one may be informed that the mat-
“ ter is thus duly prepared; and therefore the moſt
“ convenient time for exciting a ſweat muſt conſe-
“ quently be unknown likewiſe, *&c.*”

2. The other way by which a fever may terminate in health, is when the matter of the diſeaſe, whether pre-exiſting before or made by the fever, is by the force thereof ſubdued, diſſolved, and rendered pervious ſo as to circulate with the reſt of the humours through the veſſels, but as yet is not reduced to ſo great a tenuity, as to be able to paſs off by inſenſible perſpiration, and at the ſame time is poſſeſſed of properties repugnant to an

equable circulation, being alſo not capable of aſſimilation into healthy humours; and then like a foreign ſtimulus it diſturbs the body, and ought to be expelled by ſome ſenſible evacuation to reſtore health. For we find the make of the human body to be ſuch, that it cannot bear new chyle, or too great a quantity of food of difficult digeſtion without uneaſineſs, as is evident from the ſhortneſs of breath, heavineſs, oppreſſion, thirſt, increaſed heat, and often a ſlight fever, which take place after over-feeding. No wonder therefore if the matter of the diſeaſe, no longer confined to one part, but rendered moveable and wandering, ſhould excite thoſe new diſorders and diſturbances in the body, which are deſervedly termed critical, becauſe they uſually precede and ſometimes accompany the critical evacuations of the ſame matter. For this reaſon Hippocrates ſays[r]: *Quibus criſis fit, illis nox præcedens acceſſionem moleſta; quæ vero ſubſequitur, plerumque levior toleratu.* "In thoſe who have a "criſis, the night before the approach of it is "troubleſome or reſtleſs; but the night which fol-"lows after is generally more eaſy." For the morbific matter being put in motion excites a diſturbance which goes off when the matter is evacuated. Hence Galen[s] well obſerves, that great indiſpoſition always precedes a criſis, but that this happens the night before, if the diſeaſe is to have a criſis in the day; but if in the day-time, the diſeaſe will have its criſis in the night. For ſince criſes happen as well in the day as in the night, therefore this obſervation of Galen makes a juſt addition to the aphoriſm of Hippocrates. But the matter of the diſeaſe being once rendered moveable, is expelled from the body by different outlets.

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[r] Aphor. 13. Sect. II. Charter. Tom. IX. pag. 51.

[s] Method. Med. ad Glauc. Lib. I. cap. 16. Charter. Tom. X. pag. 365.

Hence it goes off by ſweat.] It is not every ſweat that can be of ſervice in fevers, as we obſerved before, and Hippocrates [t] tells us, *Sudorem multum, cum febribus acutis abortum malum.* "That a profuſe ſweat in the beginning of acute fevers is bad:" for in this caſe ſuch a ſweat is required as will evacuate from the body the matter of the diſeaſe, after being firſt ſubdued and rendered moveable by the fever itſelf. But the ſigns by which a critical ſweat may be known, are carefully enumerated by Hippocrates [u], namely, *Sudores in omnibus morbis acutis optimi ſunt, quum & diebus criticis fiunt, & febrim prorſus auferunt. Boni quoque, qui toto corpore manant, & faciunt, ut homo facilius ferat morbum; qui vero nihil horum fecerint, non utiles.* "That ſweats in all acute diſeaſes are the beſt, "when they happen on critical days, and totally "remove the fever. Thoſe are alſo good which "come from the whole body, and render the patient better able to ſuſtain the diſeaſe; but ſuch "as do neither of theſe are not uſeful." But the particular days, on which thoſe critical and ſalutary ſweats happen in diſeaſes, he enumerates in another place [w], namely, *Si nempe cœperint tertio die, quinto, ſeptimo, nono, undecimo, decimo quarto, decimo ſeptimo, vigeſimo primo, trigeſimo primo, & trigeſimo quarto: illi namque ſudores morbos judicant. Qui vero non ita prodeunt, laborem, morbi longitudinem & reverſiones ſignificant.* "If they begin on the "third day, or the fifth, ſeventh, ninth, eleventh, "fourteenth, ſeventeenth, twenty-firſt, thirty-"firſt and thirty-fourth; for ſuch ſweats terminate "the diſeaſe. But ſweats which do not come "forth on theſe days denote difficulty, or that the "diſeaſe

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[t] Prorrhet. Lib. I. N°. 57. Charter. Tom. VIII. pag. 740.
[u] In Prognoſtic. Text. 26. Charter. Tom. VIII. pag. 609.
[w] Aphor. 36. Sect. IV. Charter. Tom. IX. pag. 158.

"diſeaſe will be of long continuance, or apt to "return." (See what will be ſaid concerning this aphoriſm in the comment to § 741, treating of critical days). But he condemns cold ſweats as the worſt of all, and alſo thoſe which only ariſe about the head, face and neck; for in an acute fever death may be expected from ſuch ſweats, and in a mild fever they denote a long continuance of the diſeaſe: on the contrary, he commends ſweats which run down in drops, and aſcend in viſible vapours; and laſtly he obſerves, with reſpect to the diſtinction of good or bad ſweats, that ſometimes they ariſe from a weakneſs of the body, like thoſe cold and viſcid ſweats in dying people; and others again are expreſſed by the violence of inflammation [x], namely, when the moſt fluid parts of the blood are thus expelled in acute inflammatory diſeaſes, whence the remainder muſt be inſpiſſated with the worſt conſequences. Whoever carefully attends to all theſe particulars, will eaſily be able to diſtinguiſh, whether a ſweat ariſing in a fever will be critical and ſalutary or not. But it would be a great happineſs if the phyſician was acquainted with the ſigns whereby he might be ſatisfied that ſuch a critical ſweat is about to follow. Jacotius in his commentaries to the Coan prognoſtics [y], will have it, *Sudorem præmonſtrari urinæ & alvi ſuppreſſione, cum abſentia ſignorum hæmorrhagiæ & vomitus; maximè vero pulſu undoſo & molli, delirio dum increſcit acceſſio, calore ac rubore extimarum partium, ac vapore quodam calido, qui ante non fuit.* "That a "ſuppreſſion of the urinal and inteſtinal diſcharges, "with an abſence of the ſigns of hæmorrhage and "vomiting, give previous notice that a ſweat "will follow; but more eſpecially when the pulſe

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[x] In Prognoſt. Charter. Tom. VIII. pag. 609.

[y] Holler. & Jacot. Comment. in Coac. pag. 219.

" is ſoft and wavering, attended with a delirium " when the fever increaſes, and a heat with red- " neſs in the external parts, with a hot vapour, " which was not to be obſerved before." But it is evident, that from hence the principal ſign to be collected, is that the morbific matter is reſolved and put into motion; nor are there any ſigns denoting that this morbific matter will be diſcharged by other emunctories. But the ſoft, and knotty, but wave-like pulſe, is obſerved by Galen * to be a ſign of a future critical ſweat, eſpecially if it is alſo high and vehement: but what the nature of this knotty pulſe is he determines more accurately in another place †, where he ſays, *Vermiculans, quum ſpecies exhibitur quaſi perreptantis arteriam vermis, undarum in modum inſurgentis, quumque non uno & eodem tempore tota diſtenditur arteria. Si igitur cum diaſtoles parvitate hoc fiat, vocatur vermiculans; ſin autem cum magnitudine, undoſus ſimpliciter.* " The " vermicular pulſe is when the artery gives the ſenſe, " as it were of a creeping worm riſing up after the " manner of waves, and when the whole artery " is not diſtended at one and the ſame inſtant. If " therefore this is accompanied with a ſmallneſs of " the dilatation, the pulſe is called vermicular; but " if accompanied with a largeneſs of the diaſtole, " it is called ſimply (*undoſus*) a knotty or wave- " like pulſe." But of this nature ſeems to have been that pulſe, which the Spaniſh phyſician Solano (concerning whoſe wonderful predictions by the pulſe only we treated in the comment to § 587) calls *inciduus* or increaſing, namely, when two, three, or four pulſes ſucceſſively increaſe one above the other in the ſame order that they follow, ſo that the ſecond is ſtronger than the firſt, the third than the ſecond, *&c.* If now ſuch a pulſe is at the ſame time found ſoft, he makes it a moſt certain ſign of a critical ſweat about to happen; and ſays, that only once he obſerved a hardneſs in ſuch a pulſe, and then there was a critical jaundice ſucceeded inſtead of a ſweat[z]. But he obſerves that this kind of pulſe is more difficult to diſtinguiſh, when this wave-like motion is perceived in a ſingle pulſation, but not in ſeveral together ſucceſſively; for then unleſs the artery is ſuddenly elevated, and ſtrikes againſt the finger with a more than uſual force, it can hardly be perceived ſo as to diſtinguiſh it and form a prognoſtic from thence. Certainly thoſe pulſes riſing ſucceſſively higher than the reſt, and above each other, are not unfitly compared to the motion of waves: whence it ſeems very probable that the ſoft and wave-like pulſe of Galen agrees with that which is called *inciduus* by Solano. But it is much more difficult to deſcribe theſe pulſes by words than to demonſtrate them in the patient. This will afford a certain preſage if there are critical diſturbances at the ſame time, and if theſe happen on a critical day in a due time of the diſeaſe, and if at the ſame time no ſigns appear of any other critical evacuation.

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* De Præſagitione ex pulſibus Lib. II. cap. 9. Charter Tom. VIII. pag, 170.

† De Pulſibus ad Tyrones, cap. 8. ibid. pag. 4.

But when theſe critical ſweats are preſent, we muſt obſerve what Hippocrates mentions concerning all critical evacuations, namely, *Quæ judicantur, & quæ perfecte judicata ſunt neque movere, neque innovare oportet, nec medicamentis neque aliis irritamentis, ſed ſinere.* "That we ought to be "quiet and not to alter nor to move, neither "by medicines or any other irritating means, "the humours in diſeaſes which are about coming

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[z] Nihell of the Pulſe, &c. pag. 8, 9.

“ ing to a criſis, and which have already a “ perfect criſis [a].” Hence therefore it is always beſt to promote ſweats by ſupplying the patient with mild, diluent drinks, taking care not to let the cold air be unwarily admitted to diſturb this evacuation; but to urge a ſweat by heating ſudorifics is always dangerous. Ægineta prudently adviſes what ought to be done in critical ſweats, when he ſays; *Criticos ſudores ſinere oportet uſque ad ſufficientem evacuationem, & adjuvare calore mediocri & quiete; ſic ut nec abſtergatur ſudor, alius enim alium ducit: & calido clyſtere & ſorbitione, & ſomno.* “ That critical ſweats ought “ to be encouraged till they have made a ſufficient “ evacuation, and promoted by reſt and a mo-“ derate warmth; but yet let not the ſweat be “ wiped off, for the firſt draws more after it; and “ they may be alſo promoted by warm clyſters, “ ſuppings, and by ſleep [b].” Nor is there any great danger of theſe ſweats becoming too profuſe; for this ſeldom happens if the ſweats are not imprudently urged beyond the natural ſtrength by heating medicines. And if it ſhould ſometimes happen that the ſweat has been diſcharged too copiouſly, ſo as to weaken the patient after the fever is quieted, the body may be wiped dry, and a little cooler air be gradually admitted with caution, which will eaſily moderate the ſweats, more eſpecially if the patient leaves his bed, and ſits with an erect poſture of body as long as his ſtrength will permit.

Spitting.] In the ſmall-pox, and more eſpecially in the confluent kind, a profuſe ſalivation often ſaves the patient from the jaws of death, as we ſhall obſerve hereafter in the hiſtory of that diſeaſe;

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[a] Aphor. 20. Sect. I. Charter. Tom. IX. pag. 36.
[b] Lib. II. cap. 46. pag. 22. verſà.

eaſe; and this ſpitting being ſuppreſſed by any cauſe, all the ſymptoms become greatly increaſed, and often ſudden death follows. We likewiſe obſerve a copious diſcharge by ſpitting in thoſe fevers which are accompanied with aphthæ, in which it frequently affords great relief; but in other diſeaſes a critical diſcharge this way ſeldom happens.

Vomiting, diarrhæa.] Theſe two evacuations may purge and evacuate very different humours even from the moſt remote viſcera in the body, as will be more evident hereafter when we treat of theſe among the ſymptoms of fevers. It is no wonder therefore if the matter of the diſeaſe ſometimes diſcharges itſelf by theſe ways; more eſpecially ſince the bile corrupting is ſo frequently either the cauſe or effect of the fever, and as it may be ſo commodiouſly diſcharged by theſe ways. But as we ſaid before of the ſweats, it is not every vomiting or diarrhæa which is critical and ſalutary. For all theſe evacuations are only ſerviceable inaſmuch as they expel the febrile matter, either wholly or in part, from the body, whereby the diſeaſe may be either entirely removed, or at leaſt alleviated. For this reaſon Hippocrates[e] ſays, *In alvi perturbationibus & vomitibus, ſponte ortis, ſi quidem, qualia oportet purgari, purgentur; confert, & facile ferunt; ſin minus, contra.* "In purgings "and vomitings which ariſe ſpontaneouſly, if all "ſuch humours are evacuated as ought to be purged "off that way, they are both eaſily tolerable and "uſeful to the patient, otherwiſe the reverſe." Therefore the principal ſign whereby the uſefulneſs of theſe evacuations is known, is derived from the effects following after them. But there is great reaſon to hope that a vomiting or diarrhæa will be uſeful if they happen after the concoction or height of the diſeaſe, when nature is prevailing over the morbific matter; for thoſe which happen in the increaſe of the diſeaſe are rather ſymptomatical than critical evacuations, and often do more hurt than ſervice.

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[e] Aphor. 2. Sect. I. Charter. Tom. IX. pag. 5.

But the ſigns which teach that nature aims at theſe evacuations in diſeaſes are of the greateſt uſe to be known by phyſicians. Even Hippocrates[d] has made the following remarks: *Quicumque vero in febre non lethali dixerit, caput dolore, ut etiam præ oculis tenebricoſum quiddam, apparere ſi & oris ventriculi morſus illi acceſſerit; bilioſus vomitus aderit. Si vero & rigor acceſſerit, & inferiores hypochondrii partes frigidas habuerit, & adhuc citius vomitus aderit. Et ſi ſub id tempus quid ederit aut biberit, id perquam celeriter evometur*, "That "whoever complains, in a fever which is not "fatal, of a pain in the head, or the appearance "of a ſort of darkneſs before his eyes, attended "with a ſort of heart-burn or pain in the mouth "of the ſtomach, bilious vomitings will follow. "But if there is alſo a rigor or ſhivering attends, "and a coldneſs is perceived in the lower parts of "the hypochondria, the vomiting will then happen ſooner. And if at that time the patient "eats or drinks any thing, it will be vomited up "inſtantly after." But Hippocrates obſerves, that this takes place in a fever not fatal, becauſe a pain of the head and dark vertigo is one of the worſt ſigns in a phrenzy, nor do they then preſage a vomiting. And in his Coan prognoſtics[e] he ſays, *Quibus frebricitantibus autem anxietates ſunt, & oris ventriculi morſus, & ſputationes, vomitus fit; quibus vero ructus adſunt, flatus ſtrepitus ventris, &*

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[d] In Prognoſtic. Charter. Tom. VIII. pag. 680. [e] N° 143. Charter. Tom. VIII. p. 859.

*& elevationes, his fit alvi exturbatio.* "That "anxieties, a pain in the mouth of the ſtomach, "and ſpitting, denote a vomiting in fevers; but "when ructus's, flatulencies, rumbling of the "bowels, and a diſtenſion of the belly attend, theſe "cauſe a diarrhæa." But to theſe ſigns in another place [f] he adds tremblings, wearineſs, and pains in the loins, as tokens which denote a future evacuation by ſtool. But Galen [g] ſeems to have placed little faith in theſe ſigns of a critical diarrhæa, when he ſays that there is no manifeſt or proper ſign thereof, but only that we may ſuſpect it when the ſigns of a future criſis appear, and there is no reaſon to think that the critical evacuation will be made by any other way. But in the obſervations of the Spaniſh phyſician [h] lately mentioned, we find an intermitting pulſe is reckoned a certain ſign of a critical diarrhæa; and that according to the longer or ſhorter duration of its intermiſſion, a greater or leſs diſcharge of the matter may be predicted; and the ſame author obſerves, that he never ſaw a criſis made by vomiting only, without a diarrhæa. But when this intermiſſion of the pulſe was joined with a tenſion or hardneſs, he obſerves that vomiting ought to be predicted. Something like this is to be found in Galen [i], who yet ſeems rather to preſage from thence a vomiting than a diarrhæa: For he ſays, *Durus autem pulſus, vomitus magis, quam ſudores præoſtendere ſolet;*" and a little after he adds, *Irregularis* (ἀνώμαλος) *autem pulſus fit in plurimis quidem judiciis, & præcipue quum aliquid pugnæ & periculi habeant; multo verò magis, quum bilioſi humores ad ventriculum*

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[f] N°. 19. ibid. pag. 854. [g] Galen. de Criſibus Lib. III. in fine. Charter. Tom. VIII. pag. 449. [h] Nihell of the pulſe, &c. pag. 5. [i] De Criſibus Lib. III. cap. ultimo. Charter. Tom. VIII. pag. 448.

*ventriculum confluunt, perſtantibus etiam aliis vomituum ſignis*, &c. "That an irregular pulſe often
" happens about the time of the criſes, and more
" eſpecially when there is ſome danger and ſtrug-
" gle; but much more when the bilious humours
" flow to the ſtomach, and are attended with the
" other ſigns of vomiting, *&c.*"

But what preſage is to be formed from the colour, ſmell, *&c.* of the matter diſcharged by the vomiting or diarrhæa, will be declared hereafter when we come to treat of theſe among the ſymptoms of fevers.

Urine.] The urine naturally diſcharges all thoſe parts of the ſolids and fluids as well as of the aliments which by the continual motion and heat of the healthy body incline to acrimony, and thereby to be injurious; and therefore it is no wonder if the ſame kind of matter is ſeparated from the blood by the urinary paſſages in diſeaſes. We have already ſeen (§ 593.) that the material cauſe of the diſeaſe being ſubdued and rendered pervious by nature conquering, is diſcharged by urine; or if that is not done, an abſceſs ariſes from the depoſition of the ſame matter upon different parts of the body. But this, as we ſaid before, is obſerved in thoſe fevers of long duration, wherein the patient is in no danger; but whether or no the morbific matter is often diſcharged by the urinary paſſages, only after the critical diſturbances, which happen in acute diſeaſes running ſwiftly through their courſe, may ſtill be doubted; for at leaſt frequently we obſerve other evacuations at the end of the ſame time. When Hippocrates[k] enumerates thoſe evacuations whereby the epidemical diſeaſes which he had deſcribed uſually went off, he reckons up likewiſe a bleeding at the noſe, a plentiful diſcharge of urine with a large and laudable ſediment, and a ſeaſonable bilious diarrhæa or dyſentery; but at the ſame time he obſerves, that many were freed from the diſeaſe not by one evacuation only, but by all of them concurring together at one time. In another place having ſaid that a copious diſcharge of thick white urine frees the patient from an abſceſs, he adds in the ſame aphoriſm [l], *Quod ſi ex naribus & ſanguis profluxerit, tunc brevi admodum ſolvitur.* "But if alſo a flux "of blood comes from the noſe, then the diſeaſe "will terminate in a very ſhort time." Thus he ſeems to indicate that often an evacuation by urine only is not ſufficient, or at leaſt that it is often accompanied with other excretions. Solano the Spaniſh phyſician [m] teſtifies, that he never obſerved a criſis by urine only, without ſomething at leaſt of a diarrhæa attending at the ſame time; and therefore he has given no particular ſigns whereby one may expect a criſis by the urine, but only obſerves, that if the intermitting pulſe which denotes a critical diarrhæa be accompanied with a ſoftneſs, that then we are to expect a critical evacuation by urine, together with a diarrhæa. The ancient phyſicians ſeem alſo to have ſought more frequently for the ſigns of concoction and crudity in the urine, than to have expected a critical expulſion of the morbific matter therein. Thus they always condemn that thick and turbid urine which does not throw down a ſediment in acute diſeaſes, although it is highly ſaturated with contents; and when ſuch a thick urine depoſited a ſediment, it was rather eſteemed a ſign of concoction than a critical evacuation. Thus Galen [n] ſays, *Communis vero omnium*

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[k] Epidem. Lib. I. Charter. Tom. IX. pag. 74.

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[l] Aphoriſm. 74. Sect. IV. Charter. Tom. IX. pag. 184.

[m] Nihell of the pulſe, &c. pag. 7.

[n] De Sanitate tuenda Lib. VI. cap. 4. Charter. Tom. VI. pag. 121.

*nium turbidarum urinarum nota tibi ſit ſeparatio, vel cito, vel tardè facta, vel omninò nulla. Si enim cito fiat, & ſubſidens ſit album, & læve, & æquabile, oſtendit naturam ſuperiorem longè ſuccis, quos concoquit. Si vero bona quidem ſit ſubſidentia, ſed longiori tempore fiat, nunciat naturam etiam longiori tempore ſuperaturam ſuccos. Si vero vel omnino nulla ſeparatio fiat, vel cum malis ſubſidentiis, imbecillis natura eſt, & indiget aliquo auxilio ad ſuccos percoquendos.* "But you may take it as a common "ſign in all turbid urines, whether the ſeparation "be made ſooner, later, or not at all, that if the "ſeparation be made ſoon, depoſiting a white, "light, and uniform ſediment, it ſhews nature "much ſuperior to the humours which ſhe con"cocts; but if it has a good ſediment, only a "long time in forming, it denotes that nature "will be a longer time in conquering the hu"mours; but if there be no ſeparation at all in "the urine, or if the ſediment be bad, nature is "then weak, and requires ſome help to concoct "the humours." It is to be obſerved, that Galen ſays, nature is ſtill occupied in the concoction, even though there is a light, white, and uniform ſediment in the urine, and therefore this could not be taken as a critical evacuation, which ſuppoſes the concoction already made. Thus alſo Hippocrates ſays[o], *Optima autem urina eſt, quum alba fuerit ſubſidentia, & lævis, & æquabilis per totum tempus, donec judicetur morbus: notat enim ſecuritatem, & brevis temporis futurum morbum*, &c. "That the beſt "urine is that which has a white, light and uni"form ſediment thro' the whole time of the diſ"eaſe, till it comes to a criſis; for it denotes "ſafety, and that the diſeaſe will be of ſhort du"ration,

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[o] In Prognoſticis Charter. Tom. VIII. pag. 631.

" ration, *&c.*" From whence again it appears that from ſuch urines they preſaged the future ſalutary criſis of a diſeaſe, but never eſteemed this ſediment of the urine a critical evacuation, however well it might appear. Many more paſſages of authors might be alledged to confirm this opinion, but theſe may ſuffice to prove that a critical evacuation of all the morbific matter is rarely made by the urinary paſſages only; and many more inſtances of the ſame thing may be ſeen in thoſe patients whoſe diſeaſes are deſcribed by Hippocrates in his epidemics.

Happening after the concoction and height of the diſeaſe.] It was ſaid in the comment to § 587, that what we call concoction in fevers, is ſuch an alteration of the material cauſe by the fever itſelf, as renders it leſs hurtful, and diſpoſed to be commodiouſly diſcharged; whence the reaſon is evident why concoction ought to precede critical and ſalutary evacuations. For thoſe evacuations which are made without ſigns of a preceding concoction, follow from the over-powering force of the diſeaſe, and not from nature overcoming the diſeaſe; hence for example, as we ſaid a little before, ſweats are ſo prejudicial in the beginning of acute diſeaſes, which yet when they follow after a concoction, happily cure the ſame diſeaſe. That the ſame is alſo true of other evacuations, appears evidently from what has been ſaid before. Hence Hippocrates [p] ſays, *Judicantia in melius non ſtatim appareant.* " That the ſigns of a diſeaſe turning " for the better do not immediately appear." But when we treated of a criſis in the place before mentioned, it was obſerved, that it never happens before the height of a diſeaſe, or if it does ſo happen, it is always imperfect and never ſafe, as are thoſe concerning which we here treat.

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[p] De Humoribus Charter. Tom. VIII. pag. 545.

Uſually within fourteen days, a criſis being made.] For acute fevers uſually terminate in this ſpace of time, whence Hippocrates ſays [q], *Acuti morbi in quatuordecim diebus judicantur.* "That "acute diſeaſes terminate within fourteen days." But the term uſually is deſervedly added in the text, becauſe it cannot be abſolutely ſaid that theſe diſeaſes always terminate by a criſis made within that ſpace of time, as is evident from what was ſaid at § 564. that ſometimes acute fevers run out to a much greater length, and yet are cured by critical evacuations.

## S E C T. DXCV.

FINALLY, if the morbific matter, being ſubdued by the ſame force of the diſeaſe, diſſolved and rendered pervious, is again aſſimilated with the healthy humours, it paſſes off without a criſis or any other diſeaſe.

That manner of terminating the fever is of all the beſt and moſt healthy, in which the material cauſe is ſo ſubdued and altered by the fever itſelf as to become perfectly like the healthy humours, and may therefore flow through the veſſels with them agreeable to the laws of equable circulation, and without any injury to the functions. This might indeed be truly and properly termed a concoction or digeſtion, by which that which is concocted is converted into the ſubſtance of that which concocts, agreeable to the definition given of it at § 587. being very diſtinct from that kind of concoction which is more properly termed maturation, and whereby the matter of the diſeaſe

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[q] Aphor. 23. Sect. II. Charter. Tom. IX. pag. 65.

diſeaſe is prepared for a diſcharge. Of this we have an inſtance in ſuch as have a fever from too great a quantity of crude chyle mixing with the blood after eating too large a meal. For by this fever that crude chyle is ſubdued and aſſimilated into healthy humours; and when this is effected, that fever ceaſes without any ſenſible evacuation of the febrile matter.

But it is evident, that ſuch a termination of a fever is not to be expected, unleſs the matter is of a nature but little differing from that of the healthy humours; and unleſs the force of the fever is ſo ſmall, and of ſo ſhort a duration as not to introduce any great alteration in the healthy humours. This can therefore take place only in the ſlighteſt fevers, and is often difficult to be diſtinguiſhed from that way of terminating a fever, mentioned before in the preceding aphoriſm N°. 1. namely, when the febrile matter is ſo attenuated and ſubdued as to paſs off by inſenſible perſpiration. For an increaſe of the healthy perſpiration can only be known by the uſe of the weighing-chair, or from a ſenſe of lightneſs and activity; but the uſe of the weighing-chair cannot be applied to ſick patients; and that lightneſs and activity of body, with a perfect reſtitution of all the functions, alſo happens when the febrile matter is aſſimilated into the healthy humours, without any evacuation. But no damage is threatened to the patient from any miſtake in this matter, ſince by either of theſe ways fevers may be cured with pleaſure, ſafety and expedition.

But when fevers are gradually carried off, tho they have ſuch a material cauſe as can neither be aſſimilated into healthy humours nor expelled in the form of inſenſible perſpiration, yet the matter eſcapes through the other emunctories of the body

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but gradually, and without thoſe ſudden diſturbances which uſually precede or accompany thoſe evacuations which are properly termed critical. For it is not to be ſuppoſed that all diſeaſes which paſs off gradually, are cured without any evacuation of the morbific matter: but it is ſufficient, in this caſe, that the matter is diſcharged gradually and without ſudden diſturbances; concerning which we treated in the comment to § 587, where we ſpoke more largely of criſes.

When therefore the fever is more intenſe, or of ſo long a duration, that it has introduced great alterations in the ſolid and fluid parts of the body, one would be deceived who formed to himſelf an expectation that the fever would thus terminate. Hence the ancient phyſicians have very prudently obſerved, that always a return of the fever is to be expected, if it goes off very ſuddenly, without any ſenſible evacuation of the febrile matter, or without depoſiting the ſame by an abſceſs upon ſome particular part. Hippocrates [r] tells us, *Quibus autem febres ceſſant, neque apparentibus ſolutionis ſignis, neque in diebus criticis, illis recidiva exſpectanda eſt.* "That a return of the fever is to be expected in "thoſe who have it ceaſe neither on the critical "days, nor attended with apparent ſigns of con"coction." And in another place [s], *Non ſecundum rationem levantibus non oportet fidere.* "That "one ought not to truſt thoſe fevers which "leave the patient without a manifeſt reaſon." Thus Galen [t] alſo has the following paſſage in the beginning of his firſt book concerning critical days, *Solutiones morborum, qui non paulatim imminuti fuerunt, ſed ſubito quieverunt, ut fidæ ſint, requirunt*

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[r] In Prognoſtic. Charter. Tom. VIII. pag. 675.

[s] Aphor. 27. Sect. II. Charter. Tom. IX. pag. 69.

[t] De Diebus Criticis Lib. I. cap. 1. Charter. Tom. VIII. pag. 50.

*quirunt omnino excretionem quandam copioſam, aut abſceſſum inſignem: nam qui ſine his ceſſaverunt, recidivam facere amant.* "The terminations of "diſeaſes which do not go off gradually, but ceaſe "of a ſudden, ſhould not be truſted to, without they are attended with ſome copious evacuation or conſiderable abſceſs; for the fevers "which go off before theſe love to return again." Therefore in ſuch a caſe he adviſes an exact regimen of life, that the return of the fever may be either prevented, or at leaſt rendered leſs dangerous.

## SECT. DXCVI.

THE nature or genius, danger and duration of an acute fever, being obſerved from the beginning through its increaſe to the height, inform the phyſician in what manner it will decline, change, and terminate.

It is a matter of the greateſt importance in the practice of phyſick for the phyſician to be able to fore-know the event of a fever, whether it will terminate in death, health, or other diſeaſes, as alſo the different ways which the fever will take to thoſe ends. But in order to this, a diligent obſervation of the diſeaſe is required from the firſt beginning of it through the increaſe to its height. But what is to be underſtood by the beginning, increaſe, and height of the diſeaſe, and how various theſe are in different fevers, has been ſaid before in the comment to § 590. When a fever begins, there is always ſome apparent injury in the functions, and as the injury declines more from health by attacking more violently a greater number of the functions, ſo much worſe is the diſeaſe: for, as we ſaid from Galen in the comment to § 3: *Cujuſque morbi tanta magnitudo, quantum a naturali ſtatu recedit.* "The magnitude of every diſeaſe "is to be eſtimated in proportion to the degree "in which the healthy or natural ſtate of the body declines." If therefore the fever excited, ſuddenly changes all the effects of health, we may eaſily perceive it will be dangerous, and inclined towards death. When, for example, in the very beginning of the diſeaſe, all the ſtrength is immediately aboliſhed, the appetite is entirely deſtroyed, and the urine, inteſtinal fœces, *&c.* deviate much from their natural ſtate, there is then juſt reaſon to fear a fatal exit. This has been well obſerved by Hippocrates [u], who ſays, *Nam & mitiſſimæ febres, & quæ in ſecuriſſimis incedunt ſignis, die quarto aut ante deſinunt: maxime vero malignæ, & quæ cum graviſſimis fiunt ſignis, quarto die interficiunt, vel citius.* "That the mildeſt "fevers, and which invade with the moſt certain ſigns of ſecurity, terminate on the fourth "day, or before: but thoſe which are moſt ma- "lignant, and appear with the worſt ſigns, kill "the patient on the fourth day, or ſooner." And afterwards he adds [w], *Quæ autem breviſſimo tempore judicandæ ſunt, facillimè prænoſcuntur, maximè namque ab initio inter ſe diſſident. Qui enim ſuperfuturi ſunt, facile ſpirant, & dolore vacant, & noctu dormiunt, aliaque ſecuriſſima habent ſigna. Qui vero pereunt, difficile ſpirant, delirant, vigilant, cæteraque ſigna habent peſſima.* "But it may "be eaſily fore-known which fevers will be de- "termined in the ſhorteſt time; for they are ve- "ry irregular and differing among themſelves from

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[u] Prognoſtic. Charter. Tom. VIII. pag. 663.

[w] Ibidem, 667.

from the beginning. For thoſe patients who are to recover breathe eaſily, and are without pain, ſleep in the night, and have others ſigns of the greateſt ſecurity. But thoſe who periſh breathe difficultly, are delirious, watchful, and have other ſigns of the worſt import.”

But he acknowledges greater difficulty in forming a preſage of thoſe fevers which run through their courſe more ſlowly; for in ſuch the injuries of the functions are neither ſo violent, nor do they increaſe ſo ſuddenly; ſo that fevers often appear much alike in the beginning, when their events are various, and end in different ſpaces of time. But concerning theſe, Hippocrates [x] has the following paſſage, *At per harum initia difficilius eſt præcognoſcere, quæ intra longiſſimum tempus judicari debeant; ſimillima enim ſunt illarum principia. Verum a primo die animadvertendum eſt, & ad quemque quaternarium additum conſiderandum, nec latebit, quo vertetur morbus.* “But it is more difficult to know by the beginning of theſe, which will require the longeſt time to be determined in; for their beginnings are very much alike. But the diſeaſe muſt be watched from the firſt day, and all the circumſtances weighed upon every fourth day added to the firſt, and the inclination of the diſeaſe will not then be concealed.”

It is therefore evident, that there are certain appearances which ſometimes happen in the very beginning of acute fevers, which denote what the future event of the fever will be; but yet that a more ſure preſage may be taken from thoſe appearances which are obſervable in the increaſe of the fever, till it arrives at its height, *Sub morborum enim principia conſiderandum eſt, an ſtatim flo-*

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[x] In Prognoſtic. Charter. Tom. VIII. pag. 665.

*floreant quod ex incremento manifeſtum eſt.* "For in "the beginning of diſeaſes, it ought to be conſi-"dered whether they flower immediately, which "will be manifeſt from their increaſe." In which paſſage Hippocrates[y] elegantly repreſents the height of the diſeaſe under the metaphor of flowering, as his interpreters teſtify. For if the diſeaſe ſuddenly increaſes, it ſoon comes to its height, and the reverſe. But the good or bad event of the diſeaſe is preſaged from the mildneſs or malignity of the ſymptoms. From thence we alſo foreſee whether a ſudden critical change in a fever will be for the better or worſe; or whether the fever will go off ſlowly. For, as we ſaid before, (ſee § 401, 587.) violent diſeaſes terminate critically, but ſlight diſeaſes paſs off inſenſibly. But whether the criſis will be good or bad is likewiſe learnt from thence. For if thoſe ſudden changes happen while nature prevails over the diſeaſe, either in or after the height of it, when the ſigns of concoction have preceded, we may hope for a good criſis, eſpecially when it happens on critical days, concerning which we ſhall treat hereafter. But if the like diſturbances happen without the ſigns of concoction, nor on critical days while the diſeaſe is increaſing and over-powering nature, there is reaſon to fear a bad criſis. But what ways nature will chuſe for the critical expulſion of the febrile matter, may be likewiſe known from a careful attention to the appearances which offer through the courſe of the diſeaſe, as was ſaid more at large in the comment to § 594.

But the nature of the fever being known, will afford the greater light into all theſe particulars; and more eſpecially is this knowledge of the nature or genus of a fever neceſſary in ſuch as are epidemical. Sydenham obſerves, that the wiſeſt phyſician can neither form a ſure prognoſis, nor hit upon a right method of cure in ſuch fevers, unleſs he has firſt learnt the genius of the diſeaſe by a careful obſervation of the circumſtances of the patient, and of the ways whereby nature endeavours to cure theſe diſeaſes. Thus, for example, when the ſmall-pox are epidemic, if a phyſician viſits a patient who never had them before, but is at preſent taken with a continual fever, attended with the ſymptoms which he has obſerved in other people ſeized with the ſmall-pox, he will then expect that on the third or fourth day a critical depoſition of the morbific matter will be made towards the ſurface of the body; and he will then alſo know that this will not be a perfect criſis, ſince it does not terminate the variolous fever in health, but rather in another diſeaſe: namely, when the eruptions inflame, ſuppurate, and ſometimes turn gangrenous, *&c.* The ſame is alſo true in the meaſles, eryſipelatous, and petechial fevers, *&c.* for in all theſe the happy ſucceſs of the cure, as far as relates to the phyſician, depends on his being acquainted with the nature or genus of the diſeaſe.

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[y] Hippocrat. Epid. Lib. II. textu 6. Charter. Tom. IX. pag. 119.

But for the ſame reaſon alſo the different degree of danger in the diſeaſe ought to be regarded: but this is known from the greater or leſs velocity with which the diſeaſe increaſes, and from the different nature of the part affected with the fever. For in ſimilar circumſtances there is always greater danger in fevers in proportion as they come more ſuddenly to their height; and it is evident, that very different events may be expected, if the inflammatory or eryſipelatous matter ſhould be depoſited by the fever towards the brain, or lungs, than if the ſame matter was to ſettle upon the arm. Therefore Galen[z] ſays, *Diſtinguere autem oportet in ſingulo ægrotante, primo quidem ſi ſine loco affecto ſit febris, ex humorum putredine, vel quia ſolus ſpiritus alteratus eſt. Secundo autem ſi membrum quoddam affectum ſit cauſa, & quænam ſit ejus conditio.* "That one ought firſt to diſtinguiſh in every patient, whether the fever "is without any particular part affected, whether "it is from a putrefaction of the humours, or "only becauſe the breath is altered. But in the "ſecond place, if any particular part affected is "the cauſe, enquiry muſt be made after the "nature of the part itſelf."

Duration.] The continuance of the fever is alſo a conſideration of great moment to determine the various manner in which it may end. For if the fever has afflicted the patient a long time, it denotes that the febrile matter is very ſtubborn, and therefore the diſorder cannot be cured by a mild reſolution (§ 595); and even that it is rarely removed by critical evacuations altogether and at one time: but it may be concluded the fever will go off gradually, and take up a conſiderable time, or often return again at intervals, and go off with imperfect criſes, or elſe it will terminate in ſome other diſeaſe. Hence Hippocrates expected an abſceſs in fevers of long continuance, even though the ſick patient continued in a hopeful way, as was ſaid before at § 593. On the contrary, in fevers which are mild and of ſhort duration, a happy reſolution (§ 595.) may be hoped for, or elſe that the febrile matter ſubdued and rendered pervious by the fever, will meet with an eaſy expulſion, under the form of in-

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[z] De Criſibus Lib. II. cap. 7. Charter. Tom. VIII. pag. 416.

inſenſible perſpiration (§ 594. N°. 1). But if ſuch fevers are violent, nature being over-powered by the diſeaſe, will ſink down in a little time, and the patient will expire; or if nature conquers the diſeaſe, critical evacuations muſt be expected, (§ 594. N°. 2.)

## S E C T. DXCVII.

THEREFORE from all theſe conſiderations (§ 558 to 597.) the general rules of diagnoſtics and prognoſtics in fevers may be eaſily derived.

For we here treat only of the general knowledge of a fever of any kind; but we ſhall hereafter ſpeak of the ſeveral kinds of fevers, according as they are properly called, either continual, remitting, or intermitting; and then we ſhall alſo give the ſigns whereby theſe kinds of fevers may be diſtinguiſhed from each other.

But the diagnoſis we call the evident knowledge of the preſent diſeaſe, diſtinct from all others; (ſee the comment to § 27.) and which alſo denotes the individual nature of the diſeaſe. But there are two principles upon which the diagnoſes of diſeaſes are founded; the firſt depends on a knowledge of the preceding cauſes, which are ſuch as appear to have produced the ſame diſeaſe before: and the ſecond is a knowledge of the diſeaſe in its own nature and preſent effects. But all theſe may be eaſily deduced from what has been ſaid before. For we have enumerated and reduced the ſeveral cauſes of fevers into diſtinct claſſes (§ 586.) We have alſo explained the individual nature and pathognomonic ſigns of a fever (§ 570 to 575.); and the effects of a fever have been reckoned up at § 587. And therefore we have already treated of every thing from whence the diagnoſis of a fever may be derived; nor can there be any room to doubt in this reſpect, ſince the quickneſs of the pulſe, which attends the whole time in every fever, affords an infallible ſign. But to the diagnoſis of fevers alſo belongs the knowledge of their various ſtages or times, as diſtinguiſhed into beginning, increaſe, height, and declenſion; but of all theſe we likewiſe treated before (§ 590.)

But the prognoſis of a diſeaſe is that which acquaints us what the diſorder will be which is about to happen, and which is not yet preſent, or which directs us to foreſee the various effects and events of the diſeaſe already formed; but that this alſo may be derived from what has been ſaid before, is ſufficiently evident. For the particular cauſes of fevers have been enumerated, which (as was ſaid in the comment to § 586.) do not make the diſeaſe of themſelves, but only or at leaſt moſt frequently in bodies prediſpoſed. Thus for example, if I know a weak and valetudinary perſon is about to eat a great quantity of bacon for a breakfaſt, I eaſily foreſee that in a few hours after he will have a fever. If a plethoric perſon drinks a great quantity of ſtrong wine, is expoſed to violent heat of the air, or exerciſe of body, he runs in danger of an acute fever. But from what has been ſaid of the effects of fevers, (§ 587, 588, 589.) as alſo from the various events of them (§ 592, to 597.) terminating in health, death, or another diſeaſe, the reſt which relates to the prognoſis of fevers may be eaſily collected. Our next buſineſs is therefore to treat of the cure of fevers in general.

## SECT. DXCVIII.

THE general cure of fevers is beſt obtained, 1. If life and the vital powers are particularly regarded and maintained: 2. If the acrid irritating matter is corrected and expelled (§ 574.): 3. If the lentor or febrile coagulum is diſſolved and diſcharged (§ 577.): 4. If the urgent ſymptoms are mitigated (§ 587).

The general cure or treatment of fevers ought to be ſuch as will agree with all of them, tho' it may not in itſelf be ſufficient for the cure of all. For this general treatment regards only that which is in common to every fever; namely, a quicker contraction of the heart (§ 573): but the other ſymptoms of fevers which accompany this general one, and which differ in various fevers, or are even ſometimes contrary, require an addition to be made to this general method of treating fevers, of ſuch things as ſerve to oppoſe theſe particular ſymptoms. After we have treated of the general cure of fevers, we ſhall therefore ſpeak of thoſe means which are adapted to the principal and moſt urgent ſymptoms of fevers; and then we ſhall conſider under diſtinct heads what is further neceſſary to be obſerved beſides this general treatment in the different claſſes of fevers. For this reaſon we ſhall be therefore obliged to treat hereafter in a particular manner of fevers which are continual, remitting, and intermitting. For to enumerate all the more trifling differences of fevers would be extremely difficult, and might occaſion great confuſion.

fuſion. But it will be evident that what is required in the cure of particular fevers may be eaſily derived from the general method of treating fevers and their principal ſymptoms, provided at the ſame time thoſe particulars are known which ought to be chiefly regarded in the different claſſes of fevers.

The preſent aphoriſm therefore acquaints us with the general requiſites for the cure of fevers, each of which will be afterwards conſidered more at large.

1. Every fever ceaſes by death, (§ 571) but the cure of the diſeaſe (as was ſaid in the comment to § 4.) is ſuch a change of a living body as removes the corporeal addition which was called the diſeaſe, and reſtores that whoſe abſence made the diſeaſe. Every cure therefore ſuppoſes life remaining, and therefore this muſt be eſpecially regarded or preſerved. But the vital powers conſiſt of every thing which remains of health in the patient, and on the other hand, every thing which is abſent from health conſtitutes the diſeaſe. Hence the magnitude of the diſeaſe is meaſured by the greater or leſs receſſion of the powers from their natural and healthy ſtate; (ſee the comment to § 3.) as on the other hand the magnitude of the vital powers is eſtimated from the remaining health in the patient. From theſe alone Hippocrates has derived his preſages, which have been confirmed in prognoſtics by the conſent of ſo many ages; namely, he attentively conſidered the patient's face, eyes, tongue, external ſkin, different manner of lying in bed, chearfulneſs upon raiſing up, *&c.* and by that means he learnt how much was abſent from health, and how much of health remained in the diſeaſe. Hence Galen [a] orders all that is to be

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[a] Method. Med. ad Glaucon. Lib. I. cap. 9. Charter. Tom. X. pag. 354.

conſidered by the phyſician to be reduced under two heads, namely the diſeaſe itſelf, and the powers of the patient. Proſper Alpinus[b], conſidering theſe two, compares the diſeaſe to an enemy endeavouring to deſtroy the body; but nature he conſiders as the governor of the caſtle beſieged, endeavouring to defend the body againſt the hoſtile inſults of the diſeaſe. The ſymptoms of the diſeaſe and the powers of the patient he conſiders as the ſoldiers of the two oppoſite parties acting againſt each other; and as the governor of a caſtle ſometimes makes a ſudden ſally and attack upon the beſieging army; ſo alſo nature, armed with the ſtrongeſt faculties, and irritated by the ſymptoms of the diſeaſe, riſes up ſuddenly in the criſes, and either totally conquers the diſeaſe, or at leaſt very often deſtroys much of the power of the diſeaſe. It is therefore evident, that nothing conduces more to a happy cure than a firmneſs of the ſtrength and powers in the patient; which are therefore by all means to be preſerved. Hence the curative indication which reſpects life and its powers, is deſervedly ranked in the firſt place.

2. Hitherto belongs every thing which increaſes the quickneſs of the reciprocal influx of the nervous fluid into the muſcles, and of the blood into the veſſels and cavities of the heart, here diſtinguiſhed by the title of acrid or irritating, becauſe we have not a better word. Certain it is, that many bodies do by their ſtimulus make this irritation, whoſe acrimony is obvious to the ſenſes, and ſuch as we have enumerated at § 586. and when the like irritation follows from the other ſtimuli, which do not fall under the ſenſes, they are likewiſe uſually termed acrid from their effects. Thus for example, the contagion of the ſmall-pox, meaſles,

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[b] De Præſagienda vita & morte ægrot, cap. 1. pag. 4, &c.

plague, *&c.* is by its irritation capable of exciting the moſt violent fevers; yet no one has hitherto been able to reduce theſe with any truth to any known ſpecies of acrimony. When therefore theſe irritating cauſes are preſent, the curative indication directs either to correct them ſo that they may be no longer offenſive, or elſe to expel them from the body. But this correction is either made by diluting, whereby acrid ſubſtances, which of themſelves ſtimulate, have their particles ſo much diſperſed, that at leaſt they become leſs offenſive: or laſtly, they are corrected by ſuch things taken into the body as are able by an oppoſite force to deſtroy the efficacy of the firſt, and render the ſame perfectly inactive. Thus alcaline ſtimuli we know are corrected by acids, and acid ſtimuli by alcalines. But art is as yet deficient in moſt of theſe febrile ſtimuli, though there may perhaps be oppoſite antidotes unfound in the ſtores of nature for each poiſoning ſtimulus. Whether or no a man who has once had the ſmall-pox is poſſeſſed of this true antidote to the poiſon, though unknown to him, whereby the variolous contagion, though often received, afterwards is rendered inactive? Whether there are not cauſes in nature, though unknown, which make the plague ceaſe at length, although it has been ſpread about very largely? But whether theſe antidotes correct or weaken the poiſoning ſtimuli, or elſe diſpoſe the body ſo as to be no longer ſubject to irritation from the ſame ſtimuli, whoſe full force it afterwards retains, the effect will either way be perfectly the ſame. This particular ſeems to have been pointed out by Helmont[c], when he ſays; *Morborum ſiquidem quorumcumque, etſi duæ ſunt columnæ, quibus ædificium morboſum innititur (materia nempe occaſionalis, & materia*

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[c] In fine tractatus Ignotus Hydrops, pag. 417. N°. 49, 50.

*teria cum efficiente Archeali) alterutra tamen columnarum ſublata, ruit totum, quod illis ſuperſtructum erat. Arcana itaque Paracelſica omnem morbum a conſequenti tollunt, quatenus cauſam occaſionalem demetunt: atque deinde occultior via eſt alterius arcani, per quod ſcilicet inducitur pax, quies, & ſolatium Archeo, ne ſcilicet indignatus morbum pariat, partumque potius deleat: imo etiam profligationem cauſæ occaſionalis morbi ipſius meditetur.* "Although among all ſorts of diſeaſes there are two "pillars which ſupport the whole morbid fabric, "(namely the occaſional matter, and the matter "with the efficient archæus or ſpirit) yet either "of theſe pillars being taken away, the whole ſuperſtructure which they ſupported falls to the "ground. The ſecret medicines therefore of Paracelſus conſequently remove every diſeaſe, in"aſmuch as they deſtroy the occaſional cauſe: "and then there is a more ſecret way opened for "another arcanum or medicine, by which "namely a truce, peaceableneſs, or comfort is in"troduced in the archæus, that it may not be "made angry to excite diſeaſe, but rather allay "what diſturbance is already ſubſiſting; and even "that it may contrive the deſtruction of the occa"ſional cauſe of the diſeaſe itſelf." Many ſuch remedies have been boaſted of, but as yet they have lain in obſcurity, and have only been wiſhed for to be known. Another intention ſtill remains, namely to expel the acrid irritating ſtimulus from the body; and this is often performed by a ſalutary endeavour of nature, and ſometimes it is effected by art. Thus Sydenham [d] happily expelled the poiſoning ſtimulus from the body in the plague itſelf, by ſweats, prolonged for the ſpace of twenty-four hours.

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[d] Sect. II. cap. 2. pag. 154, &c.

3. It was ſaid in the comment to § 588. that every obſtacle impeding the free courſe of the blood through the extremities of the veſſels was comprehended under the general denomination of a lentor, in whatever way the obſtruction was formed, either from a fault of the humours, of the veſſels, or of both together. For ſuch an obſtacle may be formed at the extremities of the veſſels by an error of place, while the blood retains its due fluidity; only groſſer parts of the humours are admitted into the dilated mouths of the ſmaller converging veſſels, in the narroweſt parts of which they ſtagnate without motion. But a perfect cure of a fever requires the removal of this lentor; for unleſs this be done, though you remove the quicker contraction of the heart, in which the individual nature of a fever conſiſts, (§ 573.) yet all the actions will not be reſtored to their integrity, which ſuppoſes a perfectly free motion of the humours through all their veſſels; but here the remaining lentor will injure the actions of ſome parts; hence frequently the worſt chronical diſeaſes remain after a fever has been removed by the uſe of the Peruvian bark, becauſe the lentor was not removed together with the fever itſelf. For this reaſon alſo there is a common error which often prevails in the cure of inflammatory diſeaſes, when by bleeding, clyſters, *&c.* the force of the fever is indeed allayed, but the inflammatory viſcid matter is not diſſolved as it ought to be by a moderate force of the fever itſelf, as we ſhall explain hereafter in the comment to § 609.

4. The ſymptoms, as we ſaid before in the comment to § 11. are all thoſe preternatural appearances or effects which follow in the patient's body from the diſeaſe as the cauſe, ſo however as to be diſ-

tinguiſhable from the diſeaſe itſelf and its proximate cauſe. Theſe ſymptoms therefore belong to the effects of a fever enumerated before at § 587. and therefore the beſt method of cure for removing the effects will alſo remove the ſymptoms of the fever. But ſometimes theſe ſymptoms are ſo troubleſome to the patient that they require a ſeparate treatment, and ought to be mitigated at leaſt, if they cannot be entirely removed. Thus for example, in conſumptive patients there is an intolerable anxiety or oppreſſion perceived after the crude chyle of the ingeſted aliments heſitates in the lungs; and although this ſymptom often cannot be totally removed, yet it may be very much abated if the patient takes only thin aliments, in ſmall quantities, and at repeated intervals.

It now remains for us to enquire by what means theſe four general intentions which make up the beſt method of treating fevers may be accompliſhed: but firſt, we muſt treat of the body. We ſhall therefore ſpeak primarily of thoſe qualities which are required in the aliments and drinks to be given to a patient ill of a fever; we ſhall then determine the time when they may be moſt commodiouſly given, and laſtly the quantity of them to be taken.

## SECT. DXCIX.

THE life and powers of the body are beſt ſupported in fevers by fluid aliments and drinks eaſy of digeſtion, averſe to putrefaction, proper to allay thirſt, excite an appetite, and oppoſe the known cauſe of the diſeaſe.

There have been ſometimes phyſicians of note who have judged that no aliment at all ought to be given in the beginning of fevers[e]; and this we are told that they ſometimes practiſed even to the ſixth day; even Aſclepiades judged, *convellendas etiam vires ægri putavit, luce, vigilia, ſiti ingenti, ſic ut ne os quidem primis diebus elui ſineret, &c. Ulterioribus enim diebus cubantis etiam luxuriæ ſubſcripſit; primis vero tortoris vicem exhibuit.* "That the patient's ſtrength ought to be ſo far "from being increaſed or kept up, that it ſhould "rather be weakened by admitting the light, "watchings, intenſe thirſt, &c. inſomuch that he "did not permit even the mouth to be waſhed "during the firſt days. But in the latter days of "the fever he preſcribed the patient even a luxurious "variety, though at firſt he performed the "part of a torturer." But although Celſus does not entirely approve of this method, and thinks that the patient's ſtrength ought not in the leaſt to be weakened, becauſe from weakeneſs there is great danger; yet he recommends abſtinence from food for the firſt days, becauſe the concocting matter ought to be leſſened, which is naturally digeſted,

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[e] Celſus Lib. III. cap. 4. pag. 118, 119.

digeſted, when there is no new addition made. But at preſent we know that even in the moſt healthy people great weakneſs will follow, and all the humours incline to putrefaction, unleſs we reſtore thoſe which are conſumed by the taking in of food and drink; much more therefore may this be feared, when the force of the circulation is encreaſed by a fever; ſo that the matter overpowering the forces, is not naturally digeſted, as Celſus believed, but is rather corrupted by abſtinence. Yet this method ſeems to be very antient, for Hippocrates[f] obſerves; *Se noviſſe Medicos, his, quæ deceant, maximè contraria facientes. Volunt enim omnes, ubi ſub initia morborum homines, aut duos, aut tres, aut etiam plures dies inedia præmaceraverint, ita tum ſorbitiones, tum potus exhibere.* "That "he had known phyſicians who had acted very "contrary to what they ought; for they would "have all people in the beginning of diſeaſes "ſtarve themſelves by abſtinence for two, three "or more days, and then they adminiſter ſuppings "and drinks" It is indeed a bad practice imprudently to fill the patient with aliment, but it is more highly pernicious to weaken him by too much abſtinence: For as Celſus[g] obſerves; *Medici enim officium eſt, ut ægrum neque ſupervacua materia oneret, neque imbecilliorem fame perdat.* "It is the "buſineſs of a phyſician neither to load the pa- "tient with needleſs matter, nor to deſtroy thoſe "who are weak by abſtinence." It is therefore evident that to ſupport the life and powers of the body, food and drinks are to be exhibited; we come now therefore to conſider and declare what qualities theſe ought chiefly to have.

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[f] De Victu acutor. Charter. Tom. XI. pag. 48. [g] Celſ. Lib. III. cap. 4. pag. 120.

A healthy and robuſt body makes good humours from almoſt any kind of aliment; and in ſuch, what Helmont [h] ſays holds true; *Nuſquam qualitatem ciborum, quatenus talium, nocumentum adferre; ſolam vero quantitatem obeſſe poſſe.* "That "the quality of the aliments never offends, as "being of this or that kind; but only the quan-"tity may be amiſs." But when the body declines from health, the requiſites are wanting for a due elaboration of the ingeſted aliments, and therefore great caution is then neceſſary. But Helmont believed that the very efficacious remedies, of which he boaſted to have the poſſeſſion, were eaſily able to remove the ſymptoms ariſing from the food together with the diſeaſe, and therefore he would have it; *Diætæ neceſſitatem a penuria altiorum medicaminum, non ciborum lenocinio, invectam fuiſſe.* "That the neceſſity of diet was intro-"duced not from any virtue in the food, but for "want of more powerful medicines [i]." And thus however he acknowledges that an improper diet may offend in diſeaſes, although the ill conſequences thence preceding might be removed together with the diſeaſe by the efficacy of medicines. But to paſs by theſe let us conſider what food and drink will be moſt convenient for thoſe who are in a fever.

By fluid aliments and drinks.] For in order for the food to be converted into nouriſhment, we ſee it is firſt neceſſary for it to be changed into a fluid ſtate; for the chyle is fluid before it is mixed with the blood, and beſides the drink which is taken in, the food mixes with a great quantity of animal juices. For in the mouth it mixes with the ſaliva, in the ſtomach with the ſuccus gaſtricus, in the inteſtines with the juice of the pancreas and

both

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[h] Paradox. Sent. No. pag. 555.

[i] Ibid. No. 4.

both kinds of bile; and when the chyle has arrived to the receptacle in the loins and thoracic duct, it there mixes with the lymph returning almoſt from every part of the body. In order therefore to give the chyle a due fluidity, there is required the integrity of ſo many conſpiring viſcera, and the mixture of ſo many humours. In diſeaſes therefore wherein many of theſe functions are often diſturbed, it will be moſt convenient to give fluid aliment, that it may with leſs difficulty be formed into good chyle. Hence Hippocrates ſays [k], *Potu repleri facilius eſt, quam cibo.* "That it is eaſier "for one to be filled and nouriſhed with drink "than with food;" and in another place, [l] *Omnem victum humidum febricitantibus prodeſſe.* "That "all moiſt food is ſerviceable for thoſe who are ill "of fevers."

Eaſy of digeſtion.] The difficulty of digeſtion proceeds either from the matter itſelf to be digeſted, or elſe from the too great quantity of it, whereby even the moſt healthy body may be oppreſſed; or elſe from ſome property in the food which hinders it from being eaſily changed and aſſimilated into our own nature. That the food ought to be taken in ſmall quantities will be demonſtrated at § 601. But as in one ill of a fever a great many functions of the viſcera are often diſturbed, and as food of a difficult digeſtion requires a healthy ſtate in all theſe; the reaſon is therefore evident why food and drink eaſy of digeſtion are here neceſſary. Every thing therefore which was recommended in the comment to § 128. N°. 1. will be here convenient: more eſpecially if thoſe are choſe out from that number which are known to be contrary to the cauſe of the diſeaſe, as we ſhall ſoon declare. What is here ſaid is confirmed by the advice of Hippocrates;

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[k] Aphor. 11. Sect. II. Charter. Tom. IX. pag. 50.

[l] Aphor. 16. Sect. I. ibid. pag. 32.

crates [m]; *Quæ ſanis conferunt, ægrotis eadem exhibita valentiora ſunt, & oportet, vigore illorum detracto, exhibere, alioqui illa corpus non fert, ſed magis nocent, quam juvant.* "That aliments which "are agreeable to healthy people, are too ſtrong "when given to thoſe who are ſick, and therefore "they ought to be given after the force of them "is taken off, otherwiſe they are ſo far from "relieving the body, that they do more hurt than "good." Galen therefore juſtly condemns thoſe phyſicians, as was mentioned before upon another occaſion in the comment to § 25. who being methodiſts in name, practiſe without any due method, prohibiting the exhibition of aliment to the patient in the firſt days of the diſeaſe, while he has yet an appetite and power to take and concoct it; but afterwards they adminiſter wine and fleſh meats, and as it were pour aliment into an empty veſſel, as if it was ſufficient barely for the food to be taken into the body, which yet being weakened by the courſe of the diſeaſe, is not in the leaſt able to digeſt ſuch food.

[l] Averſe to putrefaction.] It was ſaid in the comment to § 100. that the ſalts and oils of the blood become more volatile and acrid, only by an increaſe of its circulating motion, or which is the ſame, that it thus inclines to putrefaction: Since therefore the circulation is much quicker in a fever, the ſame conſequence muſt be feared; and for this reaſon a degeneration of the humours to putrefaction is alſo reckoned among the effects of a fever (§ 587.) The reaſon is therefore evident why the diet for febrile patients ought to be choſe of ſuch a nature as is averſe to putrefaction. Hippocrates uſed only a drink of barley, or the juice and cream of it, as is evident from the accounts which he gives us in his book concerning the diet for acute

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[m] In fine Libri de Affectionibus Charter. Tom. VII. pag. 637.

diſeaſes: To theſe he added oxymel, mead and the like, all which naturally incline to a ſtate oppoſite to putrefaction; for they turn ſour. For the ſame reaſon alſo every thing which is of a fat or oily nature, and which eaſily acquires a rancid acrimony by a greater heat, ought cautiouſly to be avoided. On this account Sydenham always forbid the uſe of fleſh meats, and even of their broths in acute diſeaſes, and allowed only the uſe of panada, preparations of barley, roaſted apples, and the like. Even Helmont himſelf, though he has almoſt conſtantly cavils againſt the opinions of the antient phyſicians, and thinks the rules of diet of but little conſequence in the cure of diſeaſes, as we obſerved a little before, does nevertheleſs condemn a diet even of fleſh broths in fevers, eſpecially ſuch as are ſtrong, *Lædunt namque febrientes; quia caro, ova, piſces, & juſcula facile tum cadaverantur, ac minimè nutriunt.* "For perſons in fevers "are injured by theſe, becauſe fleſh, eggs, fiſh, "and broths, eaſily turn to a cadaverous putre-"faction, and afford little or no nouriſhment[n]."

Proper to allay thirſt.] As watery, ſubacid and obtunding medicines are the principal reckoned up againſt thirſt, it is evident ſuch aliments will be moſt convenient for this purpoſe. For fluid aliments and drinks have been already recommended, in which a great quantity of water abounds, and eſpecially ſuch as are either already acid, or which incline to be ſo; and therefore the ſame will likewiſe ſatisfy this intention.

Fit to excite an appetite.] For in fevers this is often either entirely abſent or very weak; but (*cæteris paribus*) the digeſtion of the aliments taken in ſucceeds better in proportion to the appetite. But the patient is naturally inclined to deſire ſuch aliments

[n] De Febribus cap. 12. N°. 4. pag. 772.

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aliments and drinks as have been before recommended. For if roaſted meat be offered to a febrile patient, it will be abhorred; but if ſkimmed milk, a decoction of barley with citron juice, ripe garden fruits, or the like be offered, they are generally taken. Hence the appetite itſelf of the patient frequently informs the phyſician what is moſt convenient in this caſe. For this reaſon Hippocrates[o] ſays, *Quoſcumque cibos, aut obſonia, aut potus decumbentes expetunt, ea ſuppetant, ſi nullum corpori nocumentum ſit adfuturum.* "Whatever "food, meat, or drink is deſired by ſick patients, "ſhould be allowed them if no damage to the bo-"dy will follow from thence." But even tho' what the patient deſires ſhould not be convenient, yet he orders it to be allowed, unleſs one can certainly foreſee it will be highly injurious. For thus he expreſſes himſelf in another place[p], *Paulo deterior tum potus, tum cibus, ſuavior tamen, melioribus quidem, ſed ingratioribus, præferendus.* "Meat and "drink which is worſe, if more pleaſant or deſi-"rable, is to be preferred before better, which is "leſs agreeable to the patient's appetite." Thoſe phyſicians are therefore to be condemned in this reſpect, when they think it a crime of the higheſt nature to give way in the leaſt to the deſires of the patient, which ſeem to oppoſe the rules of art, or frequently becauſe they do not conform to their preconceived hypotheſis. There are many inſtances in the writers of obſervations, which make it evident, that when patients have taken a ſtrong fancy to things, which every one might believe would be hurtful, yet they have found themſelves extremely well after taking the ſame, and frequently they have the next day been ſo well as to laugh at the threatnings of the phyſicians, who the day before predicted death from their diſobedience. A medium is therefore to be followed in theſe things; for it is not proper to ſubſcribe in a ſervile manner to every thing which the patient deſires, as is frequently done in the courts of the great; and it muſt be equally bad and injurious to the phyſician's character, always to oppoſe and reject with a moroſe ſeverity the cravings of nature, which are ſometimes ſalutary. When Sydenham [q] obſerved this in practice, he concluded, *Quod ſæpius fucum facit illa, quam talem eſſe opinamur, ratio, quam ſenſus ille certiſſimè nobis cognitus: quodque in morborum curatione plus dandum eſt ægrorum appetitionibus & deſideriis impenſioribus (modo perquam enormia non fuerint, & quæ vitam ipſo facto extinguant) quam magis dubiis & fallacibus artis regulis.* "That reaſon, which we think to be "ſuch, oftener deceives us than that which is cer"tainly known to us by ſenſe; and that more ac"count is to be made of the ſtrong deſires and "appetites of the patient in the cure of diſeaſes, "(provided they are not very enormous, and ſuch "as may actually put life itſelf in danger) than of "the more doubtful and fallacious rules of art."

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[o] De Affectionibus cap. 12. Charter. Tom. VII. pag. 633.

[p] Aphor. 38. Sect. II. Charter. Tom. IX. pag. 79.

Oppoſite to the known cauſe of the diſeaſe.] For the cauſes of fevers are various, and from them is derived the moſt certain and peculiar indication, directing the diet of febrile patients. This will appear more evidently by example: It was ſaid at § 586, that acrid foods might be the cauſe of fevers; but among theſe, different ſorts of acrimony are obſerved, which often require an oppoſite method of cure. For in young children who have a fever ariſing from an acid acrimony, becauſe they live almoſt entirely upon aceſcent food, jellies

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[q] Diſſert. Epiſtol. pag. 459.

lies of hartſhorn, ivory, and the like, are convenient, as they oppoſe the acid partly by ſheathing it, and partly by their oppoſite or alcaleſcent nature. But when a fever is kindled by food degenerating into a putrid alcaline acrimony, (ſee § 86.) the jellies before-mentioned would then be very pernicious, ſince they naturally incline to an alcaline putrefaction; and therefore in that caſe a diet is to be taken from barley, oats, and the like aceſcent food. When the impervious blood ſtagnates in the ſmalleſt extremities of the arteries in acute inflammatory diſeaſes, only ſuch aliments as are of the thinneſt and moſt diſſolving nature are convenient; but when the blood is too much diſſolved by a poiſonous ſtimulus, the diet may be prepared of aliments which incraſſate and obtund.

From what has been hitherto ſaid, one may be ſufficiently able to determine the quality of the food and drink fit for febrile patients; it now remains to be enquired in what time of the fever they may be moſt commodiouſly given.

## SECT. DC.

FOOD or aliment is to be given at that time when the fever is off, or at leaſt when its force is abated.

For the ingeſted aliments do not nouriſh, nor can they repair the ſtrength, until they have been firſt changed into our own nature by the efficacy of the veſſels and viſcera, and by mixing with a great quantity of healthy humours. But to make this change of the ingeſted aliments, requires all the actions to be entire and more perfect; but if ſome of theſe actions are deficient, we may hope for a concoction of light food which is eaſy of digeſtion, which yet is always the more happily performed as the functions are more entire. It is therefore evident, that the beſt time of all for giving food is when the fever is off; and therefore in intermitting fevers the patient is to take his aliment in the interval of time betwixt the two fits. Concerning this, Hippocrates [r] ſays, *In exacerbationibus autem (cibum) ſubducere oportet; exhibere enim, lædit. Ex quæcumque per circuitus exacerbantur, in ipſi exacerbationibus (cibum) ſubducere oportet,* "In the paroxyſms or ſharp fits of the diſeaſe, food muſt be prohibited, for to give it then is hurtful. And food is alſo to be prohibited in the greateſt ſeverity of thoſe ſymptoms which increaſe and remit through the courſe of the diſeaſe." But in continual fevers the difficulty is greater; for the vital indication calls for food to ſuſtain the powers of the patient, though at the ſame time the fever being continually preſent, does not allow of a convenient time to adminiſter it. But as we ſhall ſay hereafter at § 727, ſometimes the febrile motion, when the fever is once raiſed, continues on in one courſe to the end, which properly denominates them continual: but ſometimes the fever always continues upon the patient, but not uniformly, its force being ſometimes remitted, and at other times increaſed; and ſuch are called continual remitting fevers. In theſe therefore the beſt times of giving food will be in the remiſſions, becauſe then the force of the fevers being diminiſhed, does not ſo much diſturb the body. Hence Hippocrates [s] obſerves, *Diætices maximum eſſe, obſervare ac cavare, uti in acutis, ſic et in longis, morbis, & febrium intenſiones & remiſſiones, ut tempora caveantur,*

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[r] Aphor. 11. Sect. I. Charter. Tom. IX. pag. 15.

[s] De Victu morbor. acut. Charter. Tom. XI. pag. 177.

*antur, quibus non oportet cibos offerre, & cognoſcantur, quando tutè offerendi ſunt: uti etiam quando plurimum ab intentione abſuerint.* "It is a thing "of the greateſt conſequence for the dietetic phyſician to obſerve and take care of the intenſions "and remiſſions as well in lingering diſeaſes as in "fevers and acute caſes, that thoſe times may be "avoided wherein food ought not to be given, "and that the times may be known which are "moſt convenient for the ſupplying nouriſhment; "as alſo the times when the violence of the diſeaſe is moſt abated." But the time of giving food ought to be determined as well in remitting fevers as in thoſe which perfectly intermit, according to the different length or continuance of the intermiſſion or remiſſion. For although it is a general rule in practice that food is beſt given when the body is not at all, or leaſt indiſpoſed, *Minus enim corrumpitur, quod integro corpori infertur:* "Becauſe the aliment is leſs corrupted which is "taken into a healthy body[t]:" Yet if the time of the intermiſſion or remiſſion is ſo ſhort as not to ſuffice for the entire digeſtion of the food taken, before which a return or increaſe of a fever takes place, then another caution becomes neceſſary. This has been very well remarked by Celſus[u], where he ſays, *Neque tamen verum eſt, quod Themiſoni videbatur, ſi duabus horis integer futurus eſſet æger, ſatius eſſe tunc dare, ut ab integro corpore potiſſimum diduceretur. Sed cum hoc breve tempus non præſtet, ſatius eſt, principia cibi a decedente febre, quam reliquias ab incipiente excipi. Ita, ſi longius tempus ſecuturum eſt, quam integerrimo dandus eſt: ſi etiam breve, antequam ex toto integer fiat. Quo loco vero integritas eſt, eodem eſt remiſſio, quæ*

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[t] Celſ. Lib. III. cap. 4. pag. 122.

[u] Ibid. pag. 123.

*quæ maxime in febre continua poteſt eſſe.* "Nor "yet is it true what Themiſon imagined, that if "the patient is about to be well for two hours "time, it is then beſt to give nouriſhment, that "it may be thoroughly digeſted by the body, "while it continues well. For if it could be ſo "quickly digeſted, this indeed would be the beſt. "But as this ſhort time is not ſufficient, it is there"fore better for the patient to take food when "the height of the fever is declining, than to have "the remains of it when the fever begins again. "So that if a longer interval is about to follow, "betwixt the fits, the food is to be given when "the patient is the moſt perfectly well: but if the "interval will be ſhort, it may be given before "the fit is quite off. But what is here ſaid of a "perfect intermiſſion, is to be alſo underſtood "of a remiſſion, which may more eſpecially take "place in a continual fever."

The greateſt difficulty therefore will be in determining the time when the food ought to be given in thoſe fevers which have neither intermiſſions nor remiſſions. But in theſe fevers we obſerve three ſtages, the increaſe, height and declenſion; and the food is to be ſo managed in the taking, that the thinneſt muſt be given in the height of the diſeaſe, but in the increaſe and decline more and ſtronger aliments may be uſed. But Celſus [w] would be more ſecure in the giving food in fevers, which he would have done, *Antelucanis horis, quibus omnes fere maxime dormiunt: deinde matutino tempore, quod natura ſua leviſſimum eſt.* "Before day-break, "when almoſt all people are faſt aſleep, and again "in the morning early the food being very light in "its own nature." But a greater or leſs weakneſs in the patient, and various length of the diſeaſe, are here eſpecially to be conſidered, as we ſhall declare hereafter. Hence Celſus [x] concludes thoſe paſſages which have a juſt relation to the ſupplying food in diſeaſes, as follows, *Cum eo tamen ut nullo tempore is, qui deficit, non ſit ſuſtinendus.* "That "yet there is no time of the diſeaſe, but in which "what is wanting ought to be ſupplied."

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[w] Lib. III. cap. 5. pag. 125.

## SECT. DCI.

AND they ought to be given in a ſmall quantity at a time, and often repeated, leſt the viſcera ſhould be obliged to labour too much, or leſt the aliments ſhould be changed or corrupted.

It was ſaid before upon another occaſion from Hippocrates (ſee the comment to § 586. N°. 1.) that the food ought to be given in ſuch a quantity, as that the body may be able to conquer it. But in and by a fever many of the actions neceſſary to the aſſimilation of the aliment are diſturbed, and the more in proportion as the fever is more intenſe and of a longer duration. It is therefore required not only to give aliment which is eaſy of digeſtion, (ſee § 599.) but alſo to give it in ſmall quantities at a time. For ſince the beſt and moſt wholeſome aliments may be injurious by being taken in too large a quantity, even in the moſt healthy people, becauſe they cannot be conquered by the digeſtive powers; it will be therefore no wonder if the aliments ſhould prove hurtful from the ſame cauſe in febrile patients, when they are taken in ſuch a quantity as might indeed be eaſily tolerable to a healthy body, and yet prove too much for the weakened powers of

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[x] Ibid. pag. 127.

of the veſſels and viſcera in a ſick patient. Febrile patients therefore very badly conſult their intereſt, when they take food only once or twice in a day, as when they are in health, when it ought to be taken frequently and in ſmall quantities. Even in the moſt acute diſeaſes it is beſt to give ſome liquid nouriſhment every hour, that ſo life and the powers of the body may be ſupported, and without giving any diſturbance in the mean time from the quantity taken in.

## S E C T. DCII.

THE quantity and ſtrength of the food is determined, 1. From a fore-knowledge of the duration of the fever (§ 588, 589, 590, 596, 597.) to 1, 4, 7, 9, 11, 14, 21, 30, 40, 60 days; for ſo much aliment ought to be given as will ſupport the powers to make a concoction and criſis. The ſhorter the diſeaſe the leſs in quantity, and the weaker ſhould be the aliment given, and the reverſe. 2. From the known age of the patient, for the nearer to childhood and extreme old age, ſo much the more difficultly do animals ſupport abſtinence. 3. The ſtate and violence of the diſeaſe, if known, require a variation in the quantity and qualities of the food; in the height of the diſeaſe it ought to be extremely thin and ſmall in quantity, but in the increaſe and declenſion food may be more copious and ſtronger, as the fever is more remote from the height. 4. From the place or country which the patient inhabits, for the nearer the equator, the thinner food will be tolerable; but nearer the poles, thin aliment cannot be ſo eaſily diſpenſed with. 5. From the ſeaſon of the year, as the ſummer requires food thin and light, and the winter more ſtrong and compact. 6. From the cuſtom of the patient, and his natural habit or conſtitution; for the higher living he was uſed to when in health, and the more eaſily it was conſumed, ſo much more ought to be allowed in caſe of ſickneſs, in proportion as the veſſels and viſcera have been accuſtomed thereto. 7. From the ſenſe of lightneſs or oppreſſion following after the aliments are taken in.

Hitherto we have treated in general of the quantity and quality of the food which may be ſafely adminiſtered to febrile patients. But when this comes to be determined in every particular patient, other particulars ſtill remain to be conſidered, whereby we are led from theſe general to more ſpecial reſtrictions. As for example, the general indication demands liquid food, eaſy of digeſtion; but yet the digeſtion depends upon what remains of health in the febrile patient; ſo that hence the aliment, which was eaſy to digeſt in the beginning of the diſeaſe, may be very difficult in the height of it, not on account of the matter to be digeſted, but of the more weakened powers. Moreover, the different length of the diſeaſe, ſeaſon of the year, cuſtom and habit of the patient, may occaſion a great deal of difference in this reſpect; all which particulars we ſhall examine in their proper order under the preſent aphoriſm, that ſo we may be ſet to rights, with reſpect to the quantity and ſtrength of the food to be given.

But the ſtrength of the food is ſaid to be that which is properly ſeparated from it, and changed into our own nouriſhment by the action of the veſſels and viſcera. Hence Celſus [y] calls that food the ſtrongeſt, which contains the moſt nouriſhment. Thus there is ſaid to be leſs force in a thin fleſh broth than in a gravy ſoup. Hence Celſus [z] having reckoned up various ſorts of aliments, concludes the end of the chapter in the following manner. *Fere vero ſequitur, ut, quo valentior quævis materia eſt, eo minus facile concoquatur; ſed ſi concocta eſt, plus alat. Itaque utendum eſt materiæ genere pro viribus; moduſque omnibus pro genere ſumendus. Ergo imbecillis hominibus rebus infirmiſſimis opus eſt: mediocriter firmos media materia optime ſuſtinet: & robuſtis apta validiſſima eſt. Plus deinde aliquis aſſumere ex levioribus poteſt, in his magis, quæ valentiſſima ſunt, temperare; ſibi debet.* "But it follows as a natural conſequence, that the ſtronger any matter is, the leſs eaſy is it to digeſt, but when once concocted it nouriſhes more. Therefore the kind of alimentary matter muſt be uſed and choſe proportionable to the powers, and the manner of taking all aliments ſhould be agreeable to their nature; therefore in weak people ſubſtances of the lighteſt texture are required; but thoſe who are moderately ſtrong, are beſt ſupported by food of a middling texture, while the ſtrongeſt food is beſt adapted to nouriſh the robuſt. Moreover, a perſon may take more of the lighter kind of aliments, whereas they ought to be more ſparing in thoſe aliments, which are the ſtrongeſt." Since therefore the food is more difficultly aſſimilated by the powers of the body, when it is filled with too great a quantity of nouriſhment, it is then ſaid to have a greater force; from hence it has been cuſtomary to call ſuch foods ſtrong, as are more difficult to digeſt, though taken in a leſs quantity. Thus Celſus[a] ſays, *Ovum durum valentiſſimæ materiæ, molle vel ſorbile imbecilliſſimæ*; "That an egg dreſſed hard makes the ſtrongeſt "alimentary matter, but if dreſſed ſoft in the form "of a ſupping, it is very weak or light aliment," although a hard egg nouriſhes no more than a ſoft one. The ſtrength of the food therefore is meaſured by the quantity of nouriſhment which it contains, and the difficulty there is in extricating the nutricious parts therefrom. In the firſt caſe a greater ſtrength of the food gives uneaſineſs to weak and indiſpoſed perſons; becauſe a greater quantity of chyle being thence made, loads the blood; and in the latter caſe the *primæ viæ*, or firſt paſſages of the body are moſt affected with uneaſineſs. Hence Hippocrates[b] ſays, *Quæcumque quidem ventriculus ſuperat, quæque corpus recipit, ea neque flatum neque tormina excitant. At ſi ventriculus non ſuperet, ab his & flatus & tormina, cæteraque id genus contingunt.* "That whenever the "ſtomach is ſtronger than the food, whatever be "the matter taken into it, it neither occaſions "wind nor gripings: but if the ſtomach does not "overcome it, then flatulencies, colics, and the "like diſorders proceed from thence." But ſince by what has been ſaid before in the comment to § 599, ſuch things as create uneaſineſs in the primæ viæ are excluded from the diet of febrile patients, therefore we ſhall here treat only of that ſtrength of the food, which proceeds from its containing too great a quantity of the nutricious matter.

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[y] Lib. II. cap. 18. pag. 96.

[z] Ibid. pag. 100.

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[a] Ibid. pag. 99. [b] De Affectionibus cap. 13. Charter. Tom. VII. pag. 633.

1. The firſt and principal ſign whereby the quantity and ſtrength of the food ought to be limited for febrile patients is the known length of the diſeaſe. Galen [c] uſes an apt ſimile enough in this matter, when he compares the patient's ſtrength to one carrying a load, and the diſeaſe to the load itſelf; but the time which is taken up betwixt the beginning and height of the diſeaſe, he compares to the length of the way. As now one cannot foretel whether a perſon will be able to carry a burthen, unleſs his ſtrength, the weight of the load, and the length of the way be conſidered, ſo the ſame holds true in diſeaſes. But the duration of continual fevers is various, being ſometimes extended to the ſixtieth day, as was ſaid before on another occaſion from Hippocrates (§ 564.) and it is of thoſe chiefly that we here treat, becauſe food may be ſafely given in intermittents betwixt the fits. But although what has been ſaid in the places cited by the numbers in the text of the preſent aphoriſm, may afford much light to determine the length of the fever, yet the difficulty will always remain in knowing at the beginning how long a time the fever will laſt. Hippocrates [d] informs us indeed, that malignant fevers and thoſe attended with moſt violent ſymptoms kill on the fourth day or ſooner; and on the contrary that the moſt gentle fevers which advance with the ſafeſt ſigns, go off on the fourth day or ſooner. But even in thoſe fevers which are in their beginning very mild, and unaccompanied with very violent ſymptoms, it ſeems very difficult to pre-determine the time of their duration, becauſe at firſt there are almoſt the ſame ſymptoms in ſuch as ſoon admit of a cure, as in thoſe which continue for ſe-

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[c] Lib. III. de Criſibus cap. 5. Charter. Tom. VIII. pag. 457.

[d] In Prognoſticis Charter. Tom. VIII. pag. 663.

veral weeks. This difficulty is alſo acknowledged by Hippocrates [c] when he ſays, *At per horum initia difficilius eſt eos prænoſcere, qui intra longiſſimum tempus judicari debeant; ſimilia namque ſunt illorum principia.* "But it is more difficult to "foreknow in the beginning of thoſe fevers which "of them will be determined in the longeſt time, "for they are alike in the beginning." Nor do I believe that any one, however well verſed in practice, can be able to know that on the firſt day in the beginning of the fever it will terminate either in fourteen or in twenty days, unleſs he ſhould know this from the genus of the diſeaſe then reigning epidemical. Therefore Hippocrates juſtly adds to his former ſentence, *Quod a primo die animadvertendum ſit, & ad quemque quaternarium additum conſiderandum: neque tunc latebit, quo ſe verſurus ſit morbus.* "That attendance muſt be "given to the diſeaſe from the firſt day, and the "ſtate of it conſidered on every fourth day added "to the firſt; and then you will not be ignorant "which way the diſeaſe inclines itſelf." Nor yet can any great error ariſe from this uncertainty, which ſeems to be unavoidable in preſcribing the diet of febrile patients: for fevers of the worſt kind, which in their own nature ſpeedily tend to a malignant ſtate, theſe we know well enough how to diſtinguiſh. But in the mild kind of fevers, as a deal of health remains, a little greater ſtrength and quantity of the food can do no injury, though the fever ſhould perhaps terminate ſooner than expected. For although by foreknowing ſuch a ſudden exit of the fever, there would have been no abſolute neceſſity juſt for that food, yet aliment endowed with thoſe qualities, enumerated before at § 599, and given under the obſervance of the cautions

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[c] In Prognoſticis Charter. Tom. VIII. pag. 665.

tions (§ 601.) can hardly ever be offenſive, ſince in theſe caſes the digeſtive powers are uſually as yet ſufficiently ſtrong. Add to this, that Hippocrates obſerves, *Majus peccatum committi in tenui, quam in paulo pleniore victu, &c. Quam ob cauſam victus tenuis & accuratus plerumque paulo pleniore periculoſior eſt.* "One may offend more by a diet "too thin and ſpare, than by one which is a little "more full, *&c.* for which reaſon a very thin and "exact diet is generally leſs ſafe than that which is "a little fuller[f]." And in the preceding aphoriſm he ſays the ſame, more eſpecially with reſpect to acute diſeaſes, namely, *Tenuis & exquiſitus victus in morbis longis ſemper, tum in acutis, ubi non admittitur, periculoſus.* "That a very thin "and delicate diet is always dangerous in chronical "diſeaſes, as it alſo is in ſuch acute diſeaſes, "where it is not convenient or allowed[g]:"

This being premiſed, it will not be very difficult to adjuſt the quantity and ſtrength of the food to be given; for if, for example, I ſee the ſtrength of a fever ſuddenly increaſe, and at the ſame time not attended with malignant ſymptoms, ſuch as a difficult reſpiration, delirium, *&c.* I foreſee that an ephemera or intermittent will happen, and therefore I ſhall be but little careful about preſcribing the diet, as the fever will be off in a ſhort time, and by that means will afford the moſt convenient opportunity to ſupply the patient with nouriſhment. But if a ſudden increaſe of the fever is alſo attended with the worſt ſymptoms, I foreſee the diſeaſe will ſoon be fatal, unleſs relieved by all the endeavours of art; and therefore either no food at all ought to be given, or elſe only ſuch as is the moſt dilute, and in a ſmall quantity; as for example, a ſimple decoction of oats or barley with citron juice and the like; becauſe there is here no danger of injuring the patient by want, ſince he will ſoon either be carried off by the violence of the diſeaſe, or elſe have an opportunity of ſupporting his ſtrength with more and ſtronger food by a ſpeedy cure, or at leaſt a mitigation of the diſeaſe: but in thoſe fevers which advance more ſlowly, the patient's diet is to be ſo moderated as to ſupport the ſtrength ſufficient for the concoction and criſis, and yet in the mean time not to cauſe any oppreſſion or uneaſineſs in the patient by an imprudent exhibition of aliments. The extremes therefore of both theſe are to be avoided; *Medici enim officium eſt ut ægrum neque ſupervacua materia oneret, neque imbecilliorem fame perdat.* "For it is the buſineſs of a phyſician neither to "load the patient with ſuperfluous matter, nor "yet to deſtroy one who is very weak by abſtinence or hunger," as Celſus obſerves (ſee the comment to § 599 [h].) But we ought always to be mindful of the admonition of Hippocrates lately mentioned; namely, that a much more dangerous error may be committed in defect than in exceſs. For there is often ſome uncertainty in determining the duration of an incipient fever, as we have already obſerved; and therefore Hippocrates [i] treating on this ſubject makes uſe of the word συντεκμαίρεσθαι, which ſignifies a conjectural knowledge; for, ſays he, *Conjecturis autem etiam æger explorandus eſt, an victu ad morbi uſque vigorem par ſit futurus, & utrum ille prius ſit defecturus, neque tali cum victu ſufficere potuerit, priuſquam morbus ceſſerit, ac obtundatur.* "It muſt "be enquired by reaſonable conjectures in the pa-

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[f] Aphor. 5. Sect. I. Charter. Tom. IX. pag. 11. [g] Aphor. 4. Sect. I. ibid. pag. 9.

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[h] Celſ. Lib. III. cap. 4. pag. 120.

[i] Aphor. 9. Sect. I. Charter. Tom. IX. pag. 14.

" tient, whether the diet will ſupport him to the " height of the diſeaſe, or whether he will be " firſt taken off, if with ſuch a diet he cannot " be ſupported before the diſeaſe either ceaſes or " is leſſened." But what remains to be ſaid under this aphoriſm will ſuffice to prevent any error in this reſpect, and more eſpecially that which is compriſed in the ſeventh number concerning a ſenſe of lightneſs or oppreſſion following, for thence it will immediately appear whether the food taken is ſerviceable or not; and by this means the ſlighteſt exceſs may be ſoon diſcovered. If indeed that could be performed which Helmont [k] ſo audaciouſly boaſts of, we ſhould have no occaſion for all theſe rules of diet: *Medici nomine indignum eſſe voluit, qui febrientem non reſtituit ante quatriduum.* " For he would have a perſon to be " unworthy the name of a phyſician, if he does " not reſtore the patient from his fever within four " days time;" but in this, as well as in many other things, he ſeems to have been well ſtocked only with promiſes.

2. Hippocrates [l] tells us; *Qui creſcunt, calidum innatum habent copioſiſſimum, ideoque copioſiſſimo indigent alimento, alioquin corpus abſumitur.* " They " that are growing have more of the innate heat, " and therefore require the moſt copious diet, other- " wiſe their body is waſted away." And in the preceding aphoriſm [m] he had obſerved that children are of all the leaſt able to bear faſting. For we ſee that animals as they are nearer their origin, require ſo much the more food in proportion. Nor will this ſeem wonderful to one who conſiders in how ſhort a time they grow up from the leaſt ſize

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[k] De Febribus cap. 12. pag. 772. N°. 7.

[l] Aphor. 14. Sect. I. Charter. Tom. IX. pag. 24.

[m] 13. Sect. I. ibid. pag. 23.

ize to ſo great a bulk. The firſt rudiments of nankind which lay concealed almoſt beyond the enetration of all ſenſe in a drop of the ſeminal iquor at the time of procreation, is obſerved to row up to the bulk of ſixteen pounds in the ſpace f nine months, whence at that time there is required aliment not only to ſupport preſent nature, ut alſo to increaſe the whole, which Hippocrates as very well diſtinguiſhed, when he ſays, *Aluntur uædam ad incrementum, & ad eſſentiam; quædam d eſſentiam ſolam, ut ſenes: quædam etiam ad obur.* "Some bodies are nouriſhed both for their "increaſe as well as the ſupport of their nature or "eſſence, and ſome again only for the ſupport of "nature, as in old people; and ſome likewiſe for "ſtrength." Hence the fœtus ſeems to continually receive nouriſhment prepared by the powers of the mother's body, as long as it continues in the womb. After this when it is born into the world, it moſt commonly ſucks the breaſts of its mother; and when it has acquired a greater ſtrength of body ſo as to prepare nouriſhment for itſelf from the ingeſted food, then a healthy child uſually takes more aliment in proportion to its bulk than the ſtrongeſt man; and therefore likewiſe in diſeaſes younger patients require more nouriſhment, but to be adminiſtered under the cautions before-mentioned (§ 599. to 602.) Add to this, that when young patients lie ill of a fever, who have not done growing, all the veſſels are elongated by the increaſed force of the circulation, to which they readily yield: and from hence is obſerved that ſudden increaſe in ſtature of body in theſe after recovering from diſeaſes; and therefore here is required a proportionable increaſe of humours, that by filling the veſſels the circulation may continue equable, and ſupply ſuch elements or particles to the elongated ſolids, as may by a due coheſion, keep the parts firm, which would otherwiſe be greatly weakened by ſuch an elongation of the veſſels.

Hippocrates [n] indeed tells us, that old people bear abſtinence the moſt eaſily, and this is indeed true while they are in health, and in thoſe who flouriſh in an advanced age, becauſe they are nouriſhed neither for increaſe nor ſtrength, but only to ſupport their eſſence; and in theſe the cavities of a great number of veſſels are either entirely cloſed up, or very much leſſened, whence a leſs quantity is required of humours to flow thro' them: add to this, that all the veſſels being now more rigid, yield leſs to the impelled liquids, and many of the humours, being expelled from the body in fevers (§ 587.) will occaſion drineſs from this diminution in the quantity of liquids: *Quia naturæ progreſſum, qui eſt ad ſiccitatem, effugere non licet, ideo ſeneſcimus & corrumpimur.* "But as we cannot avoid the courſe of nature "which leads to drineſs, therefore we grow "old, decay and die," as was ſaid before from Galen upon another occaſion (§ 55.) and therefore the diſorders following from old age will be increaſed by a fever, if the patient is not relieved by a ſoft and moiſtening diet. But here more eſpecially the food muſt be given often, and in ſmall quantities, becauſe the vital ſtrength, which is weak in old people, would be extinguiſhed by greater quantities [o]; and they require but ſmall ſupplies, provided they are given continually for the reaſons before-mentioned. Add to this, that from abſtinence or faſting in great old age, often a fatal ſyncope ſoon follows; becauſe the quantity of humours being leſſened, the rigid veſſels do not contract themſelves in proportion; whence there will be no action of the veſſels upon their contained fluids; and thus one of the cauſes of their circulation through the veſſels will ceaſe, whence a ſtagnation and death: for the heart by expelling the blood from its cavities dilates the arteries, but the very next moment the arteries contracting ought to promote the impulſe of the blood to continue the circulation; and to do this it is neceſſary for the ſides of the arteries to remain contiguous to their contained humours: but the veſſels now rendered extremely rigid in old age, and the quantity of the humours being alſo diſſipated by the fever, it is evident that this effect cannot eaſily follow. And thus the reaſon is evident why abſtinence is ſo prejudicial to old people in fevers.

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[n] Ibidem.

[o] Hippoc. Aphor. 14. Sect. I. Charter. Tom. IX. pag. 24.

3. From what was ſaid at the firſt number of the preſent aphoriſm, it is evident that the patient's ſtrength ought to be ſuſtained by ſuitable aliments, that it may be ſufficient to make a concoction and criſis; that is, if we foreſee the diſeaſe will be of ſo long duration, that abſtinence cannot be ſuſtained without danger. We come now to treat of regulating the quantity and ſtrength of the food according to the different intenſity of the fever itſelf. But it has been often ſaid before that the ingeſted aliments do not nouriſh until they have been firſt ſubdued and aſſimilated by the force of the veſſels and viſcera, and by mixing with the healthy humours already concocted. This aſſimilation will be therefore better performed, as there is more of health remaining. But in the beginning of the diſeaſe the functions are leſs injured, and the humours degenerate leſs from their natural ſtate, but the body is by degrees more and

more diſturbed as the diſeaſe increaſes, 'till in the very height of it all the functions are in the greateſt diſorder; and from thence if the diſeaſe does not ſuddenly terminate by a critical evacuation or depoſition of the morbific matter, it leſſens again by degrees, and health increaſes daily. The reaſon is therefore evident why more and ſtronger food ought to be given in the increaſe and declenſion of the diſeaſe: and why on the contrary the leaſt quantity and the thinneſt food only is ſuitable in the greateſt ſtrength or height of the diſeaſe. But all this is perfectly agreeable to the doctrine of Hippocrates, who ſays, *Quum ergo morbus peracutus eſt, ſtatim & extremos habet labores, & ſumme tenuiſſimo victu uti neceſſe eſt. Ubi vero non, ſed pleniore victu uti conceditur, tantum (a ſumme tenuiſſimo victu) decedendum, quantum morbus ab extremis lenior receſſerit.* "When therefore the "diſeaſe is extremely acute, and immediately accompanied with the worſt ſymptoms, it will "be neceſſary to uſe the very thinneſt diet poſſible. "But when the diſeaſe is not ſuch, and allows "the uſe of a more plentiful diet, we may abate as "much of making the diet as thin as poſſible; "the diſeaſe being milder, is farther from being accompanied with the worſt ſymptoms[p]." But as here he ſays this concerning the violence and danger in ſeveral different diſeaſes, ſo he likewiſe affirms it with reſpect to the ſeveral ſtages of the ſame diſeaſe in the following aphoriſms [q], which run thus: *Quum morbus in vigore fuerit, tunc tenuiſſimo victu uti neceſſe eſt.* "When the diſeaſe "is in its height it will be neceſſary to uſe the thinneſt diet." And a little after, [r] *Quibus ergo ſtatim vigor eſt, his ſtatim tenuis victus exhibendus. Quibus*

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[p] Aphor. 7. Sect. I. Charter. Tom. IX. pag. 12.

[q] Ibid. Aphor. 8. pag. 13.

[r] Ibid. Aphor. 10. pag. 15.

*Quibus vero poſterius vigor futurus eſt, iis in ipſo & paulo ante ipſum cibus ſubtrahendus. Antea vero plenius alendum eſt, quo perſtet ægrotus.* "In "thoſe diſeaſes therefore which immediately come "to their height, a thin diet muſt be imme"diately uſed. But in thoſe which come later "to their height, the diet muſt be leſſened both "in the vigour itſelf of the diſeaſe, and a lit"tle before it; but till then the patient is "to be nouriſhed with a more full diet, that "he may be able to go through the diſeaſe." But phyſicians frequently neglect this rule in the directing the diet of febrile patients: for during the firſt days of the diſeaſe while the patient's ſtrength continues firm, they think he requires leſs aliment, and by that means neglect the moſt ſuitable time of keeping up his ſtrength: for when the increaſe of the diſeaſe comes on, he is leſs able to bear the food which is offered, and in the very height of the diſeaſe often every kind of aliment is rejected. Hence thoſe perform the part of a torturer, who after the manner of Aſclepiades (ſee the comment to § 599.) allow the patient ſcarce any thing, even though he deſires it, during the firſt days of the diſeaſe; but afterwards they preſcribe ſtrong and even luxuriant food againſt the inclination of the patient, when he is neither able to take nor to digeſt any thing. For the abſtinence which is neceſſary for people who are beginning to be ill, does not conſiſt in prohibiting them from all food, but only from ſuch as may increaſe the diſeaſe, or which cannot be eaſily concocted and aſſimilated by the indiſpoſed body. It will be therefore ſerviceable to give aliment in the very beginning of the diſeaſe, obſerving thoſe cautions before delivered at § 599, 600, 601. that the patient's ſtrength may be kept up, and the acrimony of the humours allayed by ſweet chyle, which acrimony may be juſtly feared as a conſequence of the fever; and at the ſame time the quantity and ſtrength of the food ſhould be increaſed or diminiſhed in a juſt proportion, according as is required by the increaſe, height, or declenſion of the diſeaſe. Celſus therefore does not ſeem to have well expreſſed the ſentiments of Hippocrates, when he orders the patient to abſtain from food for the firſt days; *Quia minui tantum materiam ſuperantem oportet, quæ naturaliter digeritur, ubi nihil novi accedit.* "Only becauſe the "offending matter ought to be diminiſhed which "is naturally digeſted, when there is no addition "made of new matter [s]." And in another place he adviſes, *Unum illud & ſemper & ubique ſervandum eſſe, ut ægri vires ſubinde aſſidens medicus inſpiciat, & quandiu ſupererunt, abſtinentia pugnet: ſi imbecillitatem vereri cœperit, cibo ſubveniat.* "Always and in every diſeaſe to obſerve this one "rule, namely, for the phyſician attending to examine the patient's ſtrength or powers at times, "and to oppoſe the diſeaſe by abſtinence as long "as they will hold out; but if he ſhould begin to "be threatened by weakneſs, he may have re-"courſe to food [t];" the contrary of which I think has been here made evident.

4. We always obſerve, as we ſhall declare in the next paragraph, that in the greateſt heats of the ſummer, a thin diet is moſt agreeable and uſeful; and on the contrary, that harder food may be taken in a greater quantity, and be eaſily digeſted during the winter's cold, when the drink may be alſo leſs, but ſtronger. They who live betwixt the tropics, and in countries neareſt to the equator, are beſt pleaſed with a thin diet, and often live healthy and contentedly only upon grain and

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[s] Lib. III. cap. 4. pag. 118.

[t] Ibid. pag. 120.

garden-fruits. On the contrary, they who inhabit near the poles have occaſion to eat fleſh and fiſh, which have been hardened by ſalting and drying in the ſmoke; and this more eſpecially, when they are obliged by the ſeverity of the winter's cold and ſnows to continue buried, as it were, in their houſes for ſome months. Such a difference in the diet of healthy people, inhabiting different countries, may likewiſe call for a great difference in the diet of diſeaſed patients, as will readily appear, only from conſidering what a power cuſtom alone has in this reſpect, as will be ſaid at N°. 6, next following. Hence ſo frequently Phyſicians, who have undertaken a part in an embaſſy into foreign countries, ſee that another method of practice is required, and that the courſe which they often followed at home with ſucceſs is there inſufficient, or even hurtful. For in this caſe, the alteration of climate makes the ſame difference, as the change of ſeaſons in the year to people who continue in the ſame country. All this has been ſummed up by Hippocrates with his uſual brevity, when among other rules of diet he ſays,[u] *Aliquid anni tempeſtati, regioni, ætati & conſuetudini concedendum eſſe* "That ſome allowance muſt be made for "the ſeaſon of the year, for the country, for the "age and uſe of cuſtom."

5. [w] *Ventres enim hyeme & vere natura calidiſſimi ſunt, ac ſomni longiſſimi. Per eas igitur anni tempeſtates copioſiora cibaria exhibenda,* &c. "For the abdominal viſcera are naturally warmeſt "in the winter and ſpring, and the ſleep is the "longeſt. During theſe ſeaſons therefore of the "year, aliments are to be given more abundantly, *&c.*" This is an obſervation of Hippocrates, who

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[u] Aphor. 17. Sect. I. Charter. Tom. IX. pag. 33.

[w] Ibid. Aphor. 15. pag. 28.

alſo ſays, [x] *Æſtate & autumno cibos difficillime ferunt, hyeme facillime, vero minus.* "That in ſummer and autumn food is not ſo much deſired, "nor ſo eaſily digeſted as in winter, leſſening in "the ſpring." If to theſe rules we add what has been ſaid in the comment to § 193, concerning the diet of wounded patients to be varied and governed agreeable to the different ſeaſons of the year, the reaſon will be ſufficient why the ſame circumſtances ought to be obſerved in the diet of febrile patients. For as we ſaid before upon another occaſion from Hippocrates, (ſee the comment to § 396. N°. 5.) *Imbecilles diætæ frigidæ, valentes vero calidæ.* "Weak or light aliments are cooling, "and ſtrong aliments heating." Hence in the ſummer-heats, for the ſake of a pleaſing coolneſs, both healthy as well as indiſpoſed people are beſt pleaſed and ſatisfied with the thinneſt liquors and the lighteſt food; but in the winter's cold, ſtronger foods and drinks are very well digeſted, and better arm the body againſt the cold.

6. This rule is frequently neglected in the diet of febrile patients; for, it is commonly believed, that thoſe who have in their health indulged their appetites, and been uſed to fill their body every day with the richeſt meats and drinks, may as well bear abſtinence as others. But the contrary of this is fact, for ſuch are of all people the leaſt able to obſerve a lower diet: for the body having been uſed to ſuch a repletion, if that is not maintained all its powers immediately ſink and periſh. This evidently appears in thoſe who are uſed to indulge themſelves every day freely in wine; for in the morning they ariſe dull, trembling and indiſpoſed for every thing, 'till their ſtrength again returns by filling themſelves with meat and drink at the accuſtomed

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[x] Hippocrat. Aphor. 18. pag. 35.

time: nor can this perverſe method of life be ſafely changed in ſuch, if it is not done ſlowly and by degrees. When therefore ſuch patients labour under fevers, if this their cuſtom is not a little indulged, phyſic will always unhappily ſucceed in them. For as Hippocrates obſerves[y], *A multo tempore enim conſueta, etiamſi deteriora, inſuetis minus moleſta eſſe ſolent.* "Things which we have "been long time accuſtomed to, although very bad in themſelves, are yet uſed to be leſs "troubleſome than thoſe which we have not "been accuſtomed to." and therefore he adviſes in another place[z], *Quibus cibis aut potibus homines in victu per ſanitatem utuntur, ex his præſentibus ad ægrotos uti oportet.* "That ſome "of thoſe meats and drinks ought to be allowed the patient which are commonly uſed in "the diet of people in health." And the ſame obſervation he makes in another place, with reſpect to the quantity of food, and the time when t ought to be given, when he ſays[a], *Atque bis de die cibum ſumere conſuetis his (ptiſana) danda eſt; ſemel vero cibum capere ſolitis ſemel danda eſt; prima die, &c. Verum per initia copiam dare ſufficiat non multam, neque ultra modum craſſam; ſed quantum pro conſuetudine quidquam inſerere convenit, & ne multa vaſorum inanitio obriatur.* "But in thoſe who are uſed to take food ' twice a day (ptiſan) is to be given twice; but ' it is to be given only once in the firſt day to ' thoſe who have been uſed to take food once ' a day, *&c.* But in the beginning it may be ' ſufficient to give not a large quantity, nor un-

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[y] Hippocr. Aphor. 50. Sect. II. Charter. Tom. IX. pag. 87.

[z] De Affectionibus, cap. 11. Charter. Tom. VII. pag 631.

[a] De Victu acutorum, text. 19, 20. Charter. Tom. XI, ag. 19.

" uſually ſtrong or groſs aliment, but as much as
" may be conveniently digeſted agreeable to the
" patient's cuſtom, that there may not too great
" emptineſs ariſe in the veſſels.

But it is to be obſerved, that Hippocrates here ſpeaks of the beginning of diſeaſes; for as the diſeaſe advances, both the quantity and ſtrength of the food ought to be leſſened, as we have ſeen at N°. 3, under the preſent aphoriſm. Many more inſtructions of the like kind are given by Hippocrates, which prove how great an allowance ought to be made for the cuſtom in the diet of ſick people; but, I believe, theſe may ſuffice.

Boërhaave was uſed upon this occaſion to entertain his audience with the following hiſtory; A man bearing the greateſt rule in a neighbouring village, being a hard drinker, lay ill of an acute diſeaſe; and the Phyſicians being called, bled him, and preſcribed a very thin diet with the moſt dilute drinks, by which the unhappy man was ſo much weakened that he was almoſt ready to expire, and yet in the mean time the violence of the fever did not much abate. Another Phyſician who uſually had the care of this patient, and who often ſhared with him in his drinking-bouts when he was in health, having been abſent for ſome days, returning again viſited his friend, and upon coming into conſultation with the reſt of the Phyſicians, ſaid laughing, that he only well knew in what ſort of pickle this body ought to be preſerved, to prevent it from putrefaction; and therefore forthwith he ordered a cup of ſtrong Rheniſh wine and ſome fleſh broth to be given him. The patient very willingly complied with his friend's advice, and by thus recovering his ſtrength eſcaped in a little time from a dangerous diſeaſe. It is therefore with the greateſt reaſon that Hippocrates ſays [b], *Morbos cognoſcimus autem edocti ex communi omnium natura, & cujuſque propria:* " That we become ſkilled in diſeaſes by " learning the nature of all mankind in general, " and of every one in particular;" for the miſtake of the Phyſicians lay in this, that they had not duly attended to the peculiar nature and cuſtom of the patient. Hence Celſus concludes [c], *Eum, qui propria non novit, communia tantum intueri debere: eumque, qui noſſe propria poteſt, illa quidem non oportere negligere, ſed his quoque inſiſtere. Ideoque, cum par ſcientia ſit, utiliorem tamen medicum eſſe amicum, quam extraneum.* " That he who is not " acquainted with all the particulars relating to the " patient in his diſorder, muſt be obliged to con- " duct his practice only by generals: but if he " can be acquainted with things more peculiar or " minute, he ought not to neglect them, but to " inſiſt upon them alſo; and therefore in two " people of equal knowledge, a friend may be a " better Phyſician than a ſtranger."

But Hippocrates [d] alſo obſerves, that the different habit or conſtitution of the patient may conduce much towards his being more or leſs able to ſuſtain abſtinence: for they cannot be eaſily ſupported by ſuch people as abound with bile, and are frequently troubled with bitter ructus's, (which he calls ἄνω ϖικρόχολους) and on the contrary ſays, Abſtinence is more eaſily tolerable to the phlegmatic.

7. A careful obſervation of what hurts or helps in diſeaſes has been always of the greateſt uſe, and it ſeems very probable that the firſt principles of the art of healing were thence derived, as Celſus [e] very

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[b] Epidem. 1. Charter. Tom. IX. pag. 80.

[c] In fine Præfationis, pag. 19.

[d] De victu acutorum, Charter. Tom. XI. pag. 55, 56.

[e] In Præfatione, pag. 9.

very well obſerves in treating on the empirical ſect of Phyſicians. For when ſick people, who lay without the help of Phyſicians, ventured ſome of them to take aliment, and others abſtained from it, ſome taking food in the fever itſelf, others a little before it, and others again after the remiſſion thereof; it was obſerved that thoſe fared beſt who took their food after the end of the fever. *Hæc ſimiliaque cum quotidie inciderent, diligentes homines notâſſe, quæ plerumque melius reſponderent: deinde ægrotantibus ea præcipere cæpiſſe. Sic medicinam ortam, ſubinde aliorum ſalute, aliorum interitu, pernicioſa diſcernentem à ſalutaribus.* "As theſe and "ſuch like occurrences fell out daily, thoſe which "anſwered beſt were remarked by diligent men, "and then they began to give the ſame advice "to other ſick people. And thus medicine aroſe "ſometimes by the health or recovery of ſome "people, and from the deſtruction of others, 'till "it became able to diſtinguiſh the pernicious from "the ſalutary effects." Nor is it to be ſuppoſed that the art ſhould be acquainted with theſe methods at its firſt riſe, and yet be wanting of them at preſent, after it has been promoted through ſo many ages, and illuſtrated with ſo many beautiful diſcoveries. Indeed there are many things ſtill unknown, and will long remain ſo, all which are yet required to be known to render us able at all times to determine from the cauſes the effects of thoſe things which are applied to the patient, agreeable to the rules of art. But this rule is the leaſt fallacious of all which immediately diſcovers the errors as ſoon as committed. For if too great a quantity or too ſtrong food is taken into the body, the patient will ſoon after find an uneaſineſs, by which we know that either the quantity or ſtrength of the food ought to be leſſened. But if the patient

tient eaſily bears the food it may be prudently increaſed, according as the greater or leſs weakneſs and different ſtate of the diſeaſe may require. Hippocrates, after giving ſome very good inſtructions with reſpect to the diet of ſick people in his book *De priſca medicina*[f], and having remarked that Phyſicians may commit as great errors by exceſs or defect, has the following paſſage moſt worthy to be regarded. *Oportet autem modum quemdam conjectura aſſequi. Modum autem neque pondus, neque ullum alium numerum, ad quem omnia referens accuratè ſcias, non invenies alium, quam corporis ſenſum. Quocirca operoſum ita accuratè condiſcere, ut parum hinc aut illinc pecces. Quanquam ego hunc medicum vehementer laudaverim parum peccantem. Exactam vero certitudinem perſpicere raro contingit.* "But ſome rule ought to be "found to guide our conjectures; but neither the "rule of weight, nor of number, nor any other "way to which all other things are referred and "accurately known, will here ſuffice; nor will you "find any other rule than the ſenſe of the body. "For this reaſon you ought accurately to learn by "a laborious obſervation neither to offend much "by exceſs or defect. I ſhould therefore greatly recommend the Phyſician whoſe error in this "reſpect is but ſmall; for to attain to an exact "certainty rarely happens." No one therefore need be aſhamed to learn by a careful obſervation in patients, whether or no he has committed any error in preſcribing the diet ſuitable in fevers, by remarking the ſenſe of refreſhment or uneaſineſs following after the taking of the food.

Theſe are the chief things to be conſidered with regard to the ſtrength and quantity of the food to be adminiſtered to febrile patients; and by the

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[f] Charter. Tom. II. pag. 156.

ſeven rules compriſed in this aphoriſm all error may be avoided, as far as is poſſible by art, as it is known at preſent. But by all theſe ways the powers of the febrile patient are ſupported, inaſmuch as they ſupply the neceſſary quantity of healthy humours, or of what is nearly of the ſame nature: and theſe are uſually called cordials, a word leſs proper indeed, but received into practice. But there are other cordials, as they are termed, whereby the too weak action of the veſſels upon their humours is increaſed, and the too ſlow motion of them through the veſſels augmented. The firſt ſort of cordials are uſually termed repletive, and the latter ſort are called ſtimulating. But ſince generally the humours have too violent motion in fevers, there is not ſo often occaſion for ſtimulants But if the febrile motion ſhould be ſo low or weak before the concoction, that the force thereof is not ſufficient to diſſolve the coagulum in fevers, then theſe ſtimulating cordials are ſerviceable. But how it may be known in the cure of fevers, that ſtimulating cardiacs are neceſſary, will be declared hereafter at § 609. N°. 3, and § 611, where we ſhall treat of thoſe which are beſt adapted for this intention.

We come next to treat of the cure of fevers by removing the ſtimulus, or coagulum, or both, which produce the fever, preſerving life entire. We ſhall firſt treat of ſtimulants, which are either ſuch as are applied external to the body, or lodged internally, whether taken into the body, or elſe formed there by a corruption of the healthy humours. The next aphoriſm then will teach what is to be done, when the cauſe of the fever is ſomething acrid or irritating lodged without the body.

## SECT. DCIII.

EVERY thing acrid or irritating externally applied to, or adhering in the body, ſuch as ſharp-pointed fragments of metal, glaſs, wood, ſtone, bone, or any ſtimulating, inflaming, corroding, bliſtering cauſtic, deſtroying or poiſonous matter of any kind, muſt be removed as ſoon as poſſible, when known or diſcovered; and then the place where they lodged, and which they injured, muſt be fomented with lenient, mucilaginous, ſoft, oily, anodyne, and gentle aperient medicines.

Theſe acrid ſubſtances, which may be externally applied to the body, are either ſuch as may injure and irritate the parts by means of their rigidity and figure, whereby they are enabled to communicate the motion impreſſed upon them by very few points; and ſuch are uſually called mechanical acrids, becauſe the action of them may be eaſily underſtood from the common laws of motion to which all bodies are ſubſervient; as when, for example, when a ſharp-pointed fragment of glaſs, metal, or any other ſuch like ſubſtance is thruſt into ſome ſoft part of the body. But there are moreover other ſubſtances, which only externally applied, inflame, irritate, and ſometimes deſtroy the parts, though ſuch effects do not ſeem capable of being derived from their figure, hardneſs, denſity, *&c.* For that which is ſo active in theſe bodies, is often of ſo ſmall a bulk, that it eſcapes every one of the ſenſes; ſo that we cannot know any thing certain of the figure, points, or the like of theſe particles. But becauſe the like effects often follow from thoſe inviſible particles, which are obſerved to be produced by thoſe that injure by a mechanical acrimony, therefore many have been pleaſed to aſcribe and ſuppoſe the ſame figure, hardneſs, *&c.* to the particles of theſe bodies. But their opinion lies open to many difficulties, for cantharides applied externally to the body excite an inflammation, and diſſolve the very tender veſſels which connect the cuticle to the ſkin, and if left upon the part too long they cauſe a deep ulceration with extreme pain. If now it be ſaid, that theſe inſects abound with ſmall particles which are rigid and ſharp-pointed, and which, being put in motion by the heat of the body to which they adhere, cut aſunder the very minute veſſels, it may be aſked why the ſame particles, moving through the minute veſſels of the living inſect itſelf, did not deſtroy them in the like manner. When a viper has made a ſmall wound with his tooth, and injected ſome of its poiſon, the moſt ſevere inflammation, fever, anxiety, *&c.* and often Death itſelf follows: and yet this poiſon both as to taſte and colour comes neareſt in reſemblance to oil of almonds, manifeſting little or no acrimony to the ſenſes; and what is more, this, which is ſo dangerous a poiſon, when mixed immediately with the blood, is nevertheleſs ſwallowed without any bad conſequence (ſee the comment to § 155.) But it is ſufficient for the Phyſician to know what theſe and the like ſubſtances applied to the body can effect, and to be acquainted with the remedies whereby the injuries thence following may be removed or corrected: nor will it be any diſgrace ingenuouſly to confeſs his ignorance of thoſe things which are not yet underſtood, ſince the moſt plauſible hypotheſes do not anſwer and agree with all the appearances, and it is often dangerous to derive rules from ſuch hypotheſes, to direct us in what is neceſſary for the removal of the injuries. Now theſe acrid ſubſtances, whoſe effects we know by obſervation, but whoſe manner of action we are often unacquainted with, do frequently produce very different effects, according to their different ſtrength and the time in which they continue to be applied. The milder kind of theſe ſtimulate the parts but ſlightly, and then produce a ſlight eryſipelas, and are therefore called rubefiers, becauſe they introduce ſuch a colour into the ſkin. But the more acrid of theſe, or even the former, left a longer time upon the parts, raiſe the cuticle into a bliſter, and corrode the ſkin. But cauteries, if actual, immediately deſtroy the part to which they are applied, and change it into a dead eſchar or ſcab; and even the potential cauteries produce the ſame effects, though more ſlowly. But there are ſome things which not only deſtroy the continuity of the parts, but at the ſame time diſpoſe them to the worſt putrefaction, and change the whole into a moſt ſtinking corruption, as is evident from what has been ſaid before at § 425. Thus the lixivium of quicklime, which does not ſeem very acrid to the taſte, being mixed with the moſt healthy humours, as urine for inſtance, immediately cauſes them to exhale a moſt volatile and cauſtic ſalt, like unto that which is produced by putrefaction. The imprudent application of corroſive ſublimate to conſume an external tumour, has converted all the humours of the body into the moſt ill-ſmelling corruption (ſee the comment to § 586, N°. 4.) But as theſe external acrid ſubſtances have ſo great a malignity, they are therefore juſtly termed poiſonous.

When therefore it appears by a careful examination, that the cauſe of the fever proceeds from ſuch things externally applied, the only cure is to remove them immediately; for ſince even by theſe a fever may be excited in the moſt healthy body, it is very evident that no other method of cure remains. This Diemerbroeck[g] had an opportunity of obſerving in many patients, who believed themſelves taken with the plague, becauſe they had an oppreſſion at the heart, with an internal heat, and in the middle of their breaſts found blackiſh coloured puſtules: but that knowing Phyſician readily perceived that theſe were no ſymptoms of the plague, but of an amulet of arſenic, which was ſold by impoſtors at an high price, as a certain prophylactic or preſervative, and which being applied to the breaſt had produced theſe complaints, and therefore by immediately throwing aſide the amulet, he happily ſet them at liberty from imminent danger.

How ſharp-pointed fragments of metals, ſtones, *&c.* which injure by a mechanical acrimony, ought to be removed, and what things are to be obſerved in the performance thereof, has been already declared in the hiſtory of wounds (§ 186 to 189); and theſe being removed, the reſt of the cure may be underſtood alſo from the cure of wounds. But when the fever proceeds from other acrids, as for example, cantharides, arſenic, or the like, greater caution is required; for frequently the minute particles of theſe, namely, if they were reduced into and applied under the form of a fine powder or meal, lodge themſelves under the ſcales of the cuticle, and ſtill continue to exert their virulence; whence a very careful waſhing and cleanſing of the part affected is neceſſary.

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[g] De peſte Lib. IV. cap. 99. pag. 319.

Moreover, the part injured is often excoriated, or deeply corroded, and the nervous part of the ſkin becomes irritated and painful by the touch of every thing that is the leaſt acrid, inſomuch that frequently it cannot bear the contact of the air, without extreme pain, whence inflammation and fever frequently follow. Therefore the part ought to be fomented with the moſt emollient decoctions, ſuch are thoſe beſt made of marſh-mallows, mallows, mullen, linſeeds, quince ſeeds, and the like mucilaginous ſubſtances. The moſt emollient ointments, as of poplar, roſes, *&c.* are uſed for the ſame purpoſe, and anodynes are likewiſe added to theſe, to abate the troubleſome ſenſe of pain in the part. And if at the ſame time all the parts are relaxed by the fomentations, they are by that means well diſpoſed to make an eaſy expulſion of any part of the acrid matter, which may ſtill adhere. Forms of theſe remedies may be ſeen in the Materia Medica of our author at the number correſponding to that of the preſent aphoriſm.

## S E C T. DCIV.

THE acrid irritating matter lodged internally, whether ariſing from an inflammation, ſuppuration, gangrene, ſphacelus, cancer, caries of a bone, ichor, pus, or ſharp and ſtagnant lymph, ought to be removed or corrected, agreeable to the rules before given in the hiſtory of theſe diſeaſes already premiſed. If any acrid and poiſonous, or epidemical contagion be received into the body, ſo as to irritate the vital powers, it ought to be treated agreeable to the rules laid down for epidemical diſeaſes (§ 1407 to 1412).

But when the acrid irritating matter is lodged internally, the cure is more difficult, as the part affected does not come under the obſervation of the ſenſes, and topical medicines cannot always be aplied ſo as to extend with their virtues entire to the affected part; and yet in the mean time a removal of this acrid matter lodged internally is abſolutely neceſſary for the cure of ſuch fevers; and hence appears the reaſon of the greater difficulty which attends their cure. In the next place, the principal kinds of this acrimony are enumerated.

From an inflammation.] That a fever is an inſeparable companion of inflammation, we have already ſeen in the comment to § 558. And when the ſmalleſt veſſels being ſtopped up with impervious humours, are urged by the impetus of the blood acting behind, there follows a diſtraction of the ſmall nervous fibres, from whence we obſerve pain, and at length a ſeparation of the continuity, with almoſt all the other effects which follow from the application of acrids externally. Helmont was therefore in no great error, when he conſidered a pleuriſy as a thorn fixed in the intercoſtal membranes, and he ſays, that the pulling out this thorn makes the cure of the diſeaſe (ſee the comment to § 396. N°. 2.): but this thorn was not an hoſtile acid as he believed, but a denſe inflammatory matter impacted into the extremities of the ſmalleſt arteries, and which, in vain, he attempted to remove by his ſpecifics. But a fever ariſing from an inflammation cannot be removed, unleſs that matter is reſolved; for when the inflammation turns to a ſuppuration or a gangrene, the fever continues, and is even increaſed. Hence thoſe have been groſsly miſtaken, who have endeavoured to cure the fever which attends acute inflammatory diſeaſes by the Peruvian bark; for although the violence of the fever might be thus kept under, yet the ſame ſtimulus remaining will immediately after renew the fever again. The only cure therefore for ſuch fevers is by reſolving the inflammation; and yet this reſolution of the inflammatory matter in the cure of intermitting fevers, by too much weakening the body, does great miſchief.

Suppuration.] In the comment to § 387, we ſaw that the fever, pain, and other ſymptoms of the inflammation, when being incapable of reſolution, it turned to ſuppuration. But although, as was there obſerved from Hippocrates, all the ſymptoms are worſe while the matter is forming than after it is completely made; yet unleſs that matter can be evacuated which is collected in the internal parts of the body, it becomes attenuated, acrid, and putrefying, erodes and inflames the adjacent parts, is then abſorbed by the open mouths of the ſmall eroded veins, infects the blood, and kindles the very worſt kind of fevers (ſee § 406.) never curable, unleſs the purulent ſtimulus can be corrected and expelled. In conſumptive people, whoſe lungs waſte away by a ſlow ſuppuration, there is a continual ſlight fever, which often increaſes every day at the time when freſh chyle is plentifully ſupplied and driven together with the blood through the lungs: ſome people therefore, believing this fever to be of the intermitting kind, have made trial of the virtues of the bark, but always with the moſt fatal ſucceſs; for the purulent ſources remaining, they in the mean time ſuppreſs the febrile motion, whereby the collected matter ought to have been expelled, whence the greateſt anxieties and ſometimes death itſelf has followed from that practice. For the whole cure of ſuch a diſorder conſiſts in waſhing out as it were, and deterging the purulent matter, and then to conſolidate the parts thus cleanſed from the matter, as in the cure of a clean wound. But it is often out of the power of art to effect what the curative indication demands; becauſe when the beſt decoctions for this purpoſe, from the roots of China, ſarſaparilla, vipers graſs, agrimony, betony, *&c.* are drank in large quantities, the patient's ſtrength cannot ſupport them, but they run off immediately into profuſe ſweats, with a great and ſudden dejection of the ſtrength, or ſometimes they run off with equal violence and danger by ſtool. For unleſs the powers are ſufficiently ſtrong, the patient cannot be able to take, retain, and circulate ſo great a quantity of theſe decoctions, through all parts of the body; hence therefore matter will be accumulated and renewed every day in the affected part, if it is not expectorated; whence the fever increaſes, and the body being conſumed, at length expires juiceleſs and tabid.

Gangrene, ſphacelus, &c.] For if laudable matter only by heat and ſtagnation corrupts in the part where it is confined, and being abſorbed by the veins may kindle the worſt fevers, much more may the ſame be feared from the gangrenous ichor and putrefaction of parts corrupted by a mortification. Add to this, that a ſeparation of a gangrene or ſphacelus can never be obtained unleſs the margins of the adjacent living parts ſuffer an inflammation, and then ſuppurating divide the dead from the living; and thence again a fever ariſes. What injuries ariſe from a cancerous ichor, and what enormous pains and fevers are excited, while the living parts are gradually corroded thereby, has been declared before at § 499. as alſo what maladies enſue the worſt putrefaction in a corruption of the bones, and more eſpecially of their contained marrow (§ 526.) If therefore fevers ariſe from irritating acrimony produced by theſe maladies, it is ſufficiently apparent that the cure of thoſe fevers will depend upon the cure of thoſe diſeaſes, concerning which we treated more at arge in the hiſtory of each.

Sharp and ſtagnant lymph.] The lymph is often accumulated in the larger or ſmaller cavities of the body, as we ſhall hereafter explain more at arge when we come to treat of a dropſy; and as the lymph is at firſt mild and without acrimony, t offends only by its weight and compreſſure. But by long reſt the lymph gradually corrupts, and turns acrid ſo as to erode and inflame the containing parts; and partly from this cauſe and from he abſorption of the putrid ichor by the bibulous viens, a fever of the worſt kind is excited, in which there is intenſe heat, although the dropſy s in its own nature a cold diſeaſe. The cure of uch a fever requires an expulſion of the acrid and tagnant lymph, or a correction of the putrefaction already formed, and a prevention of it for the future. From hence it is alſo evident that bitters, alcalies, ſtrong ſpices, *&c.* which are ſo uſeful in the beginning of a dropſy, do great miſchief when the ſtagnant lymph is once begun to putrefy.

Epidemical acrid, *&c.*] The ſeveral kinds of acrimony before enumerated which by their ſtimulus excite a fever, may be reduced to ſome known claſs of acrimony, for which we are provided with the moſt efficacious remedies. But fevers which ariſe from an epidemical acrid, or a poiſonous contagion, are much more difficult to be underſtood and cured. But although the ſubtlety of theſe is ſuch that they manifeſt themſelves only by their moſt malignant effects in the body, yet becauſe they irritate the vital powers with a great force, therefore they are uſually called acrid, though it does not ſeem eaſy to reduce them to any known claſs of acrimony. The only method with which art is provided for curing theſe diſeaſes, (unleſs a ſpecific antidote for them ſhould happen to be diſcovered) is by a careful obſervation to diſcover what ways nature, irritated by theſe ſtimuli, makes uſe of to deſtroy their force, or expel them from the body; and then to imitate and forward as much as poſſible theſe ſalutary endeavours of nature. For we know nothing à priori of theſe cauſes, but all the curative indications ariſe from the nature and hiſtory of the diſeaſe being known throughout its whole progreſs. But what rules are to be obſerved in diſcovering ſuch diſeaſes, and in finding out their latent diſpoſitions, will be explained hereafter when we come to treat of epidemical diſeaſes under their particular head.

## SECT. DCV.

THE acrid irritating matter introduced into the humours themſelves by uſe of the ſix non-naturals, may and ought to be removed or corrected by different remedies, according to its own and different nature.

It has been cuſtomary with phyſicians, in diſcovering the remote cauſes of diſeaſes, to aſſiſt their memories by proceeding methodically and reducing them to certain claſſes, under the title of non-naturals; calling them ſo becauſe by the uſe or abuſe of them, they may be good and natural, or bad and againſt nature[h]. But generally the non-naturals are uſed to be compriſed under ſix heads, namely air, food and drink, motion and reſt, paſſions of the mind, things retained and diſcharged, ſleep and vigilance. But by running through each of theſe by themſelves, we enquire whether the preſent fever in the patient ariſes from one or more of theſe cauſes, and when this has been diſcovered, it may be eaſily determined what remedies will be convenient for the cure of a fever whoſe cauſe is thus known. For in fevers ariſing from an abuſe of the ſix non-naturals, a ſkilful phyſician may be of very great ſervice; when on the contrary he is obliged to perform only the part of a ſpectator in thoſe fevers which ariſe from an epidemic or poiſonous ſtimulus, until by a careful obſervation he has learnt the genius and courſe of the diſeaſe, with the various endeavours of nature; becauſe the nature of ſuch a ſtimulus can only be

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[h] Herm. Boerh. Inſtit. Medic. § 745.

known by the effects which it produces in the body of the patient; therefore the dignity or uſefulneſs of this diſcovery of the cauſes directing to the cure of fevers calls for a conſideration of them under each of the following heads.

1. Thoſe which ariſe from too much exerciſe or motion, are cured by reſt of body and mind, with ſuch aliments and medicines as moiſten, dilute, and ſoften or allay acrimony.

We have already ſeen in the comment to § 585. N°. 3. that acute and mortal fevers may ariſe from too violent exerciſe of body. And if we conſider the effects which follow in the body from too great motion, the reaſon will be evident why only the remedies reckoned up in this number are of ſervice. For by violent motion of the body, the velocity of all the humours is increaſed, ſince the contraction of the muſcles quickens the motion of the venal blood towards the heart, whence one of thoſe cauſes (and a very powerful one) producing the heart's motion is increaſed, ſince even thereby the motion of the heart may be renewed in a dead body, as we ſaid before in the comment to § 574. But the veins being thus depleted, the arteries more eſpecially propel their contained humours through the ſmalleſt extremities, into the now leſs reſiſting veins, and therefore the velocity of the circulation will be increaſed thro' all the veſſels. But this cannot be performed without applying the humours oftener, or in a greater quantity, to the ſecretory organs in the ſame time, whence the more fluid parts of the blood will be diſſipated, and eſpecially in ſweats; thus what remains will be inſpiſſated, and by the greater action of the veſſels upon their contained fluids, and of the reacting fluids upon the veſſels, the blood acquires an inflammatory denſity. Add to this, that by the violent attrition of the ſolids and fluids together, with the heat thence ariſing, all the humours will incline to a greater acrimony, and the ſalts and oils of the blood will become more acrid and volatile, ſee § 100. This we are alſo taught by the urine, which being diſcharged after violent exerciſes of body is obſerved very red, acrid, ſcalding, and ſtrong ſmelling. The firſt thing therefore required here is to allay the too great motion of the humours by reſt of body and mind; for it would be in vain to hope for a cure, if the cauſe producing the diſeaſe continues to act. Hence Hippocrates [i] obſerves; *In omni corporis motu, quum id laborare cœperit, quies ſtatim laſſitudinem levat.* "That whenever the body begins to be indiſpoſed " from any kind of motion, reſt immediately re" lieves the wearineſs." And we even ſee that thoſe who have been tired with too much motion, naturally give themſelves over to reſt, and often refuſe their food by too great wearineſs. Hence Celſus [k] ſays; *Si quando tamen inſuetus aliquis laboravit, aut multo plus, quam ſolet, etiam is qui aſſuevit, huic jejuno dormiendum eſt: multo magis, ſi etiam os amarum eſt, vel oculi caligant, aut venter perturbatur. Tum enim non dormiendum tantummodo jejuno eſt, ſed etiam in poſterum diem ita permanendum, niſi cito quies id ſuſtulit.* "But when a perſon has laboured who has not " been uſed to it, or if more work has been " done than uſual by a perſon who has been even " accuſtomed to labour, ſuch a one ought to ſleep " with an empty ſtomach, and much more ſo if " there is a bitterneſs of the mouth, a dimneſs of

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[i] Aphor. 48. Sect. II. Charter. Tom. IX. pag. 86.

[k] Lib. I. cap. 3. pag. 25.

" the ſight, or a diſturbance in the bowels. For " then he muſt not only ſleep faſting, but continue " ſo for the next day, unleſs reſt ſoon removes " his complaints."

But theſe bad ſymptoms happen more eſpecially when the bile, being rendered acrid by too much exerciſe, fluctuates in too great a quantity about the præcordia: And from hence at leaſt it is evident that reſt is the chief remedy to be uſed after too much exerciſe; and therefore a little after he ſays[1] in the ſame chapter, *Poſt iter, primum ſedile, dein unctio*, &c. " After travelling on foot, the " perſon muſt firſt reſt and then uſe unction, " *&c.*" But ſince commotions of the mind may excite a much greater velocity in the circulation than motion of the body (§ 586. N°. 3.) the reaſon is evident why reſt of mind is alſo highly neceſſary. But becauſe the mouths or beginnings of the veſſels are too much dilated by exceſs of motion (ſee § 100.) therefore the groſſer humours will enter the ſmaller veſſels by an error of place; but this is a diſorder which will be removed by reſt: For when a leſs force urges behind, the veſſels contracting by their natural ſtrength repel back the erroneous particles into the larger trunks, whence the obſtruction ariſing from this cauſe is reſolved. This effect is apparent even to the eye in thoſe who by violent running look red all over their body, from the entrance of the blood into the ſmaller cutaneous veſſels, but after they have reſted for a time, that redneſs abates, and at laſt the body recovers its natural colour.

It now remains for us to ſee what helps are required to reſtore thoſe parts of the humours which were waſted by exceſs of motion, and to correct the defects which follow from thence: But this is done by

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[1] Lib. I. cap. 3. pag. 27.

Such aliments and medicines as moiſten.] For by too much motion of body the moſt liquid part of the humours is diſſipated, and the reſt conſequently becomes drier and thicker: Therefore every thing that is moiſtening proves in this caſe moſt uſeful, whether internally taken or applied to the external ſurface of the body. Hence Ægineta [m] directs thoſe who have a fever from wearineſs, to rub themſelves gently with oily or fat ſubſtances, and to go into the warm bath: And Trallian [n] directs all thoſe methods to be taken which may rather increaſe the moiſture than exhauſt it out of the body. Therefore he only recommends gentle friction, becauſe more violent increaſes the motion, and then to anoint the whole body with water and oil, and to cheriſh it afterwards in the warm bath. The like advice is alſo given by Celſus [o].

Dilute.] What diluents are and how they act, has been ſaid before in the comment to § 132 and 134. But by exceſs of motion, as was ſaid before, the moſt fluid parts are diſſipated, and the particles of the blood being compacted together, by a greater action of the veſſels upon their humours, become impervious; and therefore both theſe effects require diluents, inaſmuch as they reſtore the particles loſt, and by their interpoſition betwixt thoſe of the blood, prevent their mutual contact and coheſion. But diluents act the beſt of all if they are made warm (ſee § 134.), for cold things, whether drank or applied to the external ſurface of the body, after it has been heated by violent motion, may do great damage (as was demonſtrated in the comment to § 118.) The ſame thing is alſo

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[m] Lib. I. cap. 16. pag. 18. verſa. [n] Lib. XII. cap. 1. pag. 671. [o] Lib. I. cap. 3. p. 25.

alſo carefully adviſed by Celſus when he ſays; *Illud quoque noſſe oportet, quod ex labore ſudanti frigida potio perniciosiſſima eſt: atque etiam, cum ſudor remiſit, itinere fatigatis inutilis.* "It ought alſo to "be obſerved that drinking of cold liquors is ex"tremely pernicious in a perſon ſweating by la"bour; And alſo that it is not uſeful even after "the ſweat is abated in ſuch as have been tired "by travelling[p]."

Soften or allay acrimony.] For ſince exceſs of motion renders the ſalts and oils of the blood more acrid and volatile, therefore ſoftening and ſheathing ſubſtances, which obtund all acrimony, will be of the greateſt uſe; and more eſpecially ſuch of theſe as are by their own nature inclined to reſiſt all putrefaction, as are all mealy ſubſtances. Hence decoctions of oats, barley, whey, milk and water, and the like, are of the greateſt ſervice in theſe caſes. By all theſe means the moſt violent and inflammatory diſeaſes which are uſed to ariſe from too much motion of body, may be frequently prevented. Therefore in Aſia the inn-keepers take the wearied travellers into a warm bath, then ſupply them plentifully with drinks made warm, and at length with food conſiſting almoſt entirely of grain and garden-fruits, and then at laſt they are well refreſhed by ſound ſleep.

2. Such as ariſe from too intenſe heat of the air are beſt cured by moderating that heat, by the exhalation of cold things, eſpecially ſome plants proper for this purpoſe, and by the drinking of water nitrated a little acidulous, or rendered ſubacid with a little wine, by ſubacid and balſamic food very little ſalted, and medicines of the like nature.

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[p] Lib. I. cap. 3. pag. 26.

For by too great heat of the air we know that the moſt fluid parts of the blood are diſſipated, and the ſmall veſſels dried up. Every one has experienced this who has travelled in the ſummer-time thro' a ſandy country; for the noſtrils, eyes, internal parts of the mouth and fauces, then become extremely dry; and therefore almoſt the like maladies are to be expected as follow from too much exerciſe or motion of body. But the very ſpeedieſt degeneration of the humours into the worſt putrefaction is obſerved in a very hot air. This is very well demonſtrated by experiments in the chemiſtry of our celebrated author[q], who procured healthy living animals to be detained in a place the air of which was 48 degrees hotter than the blood of a healthy child. It then appeared that in about the ſpace of 28 minutes the animal was ſuffocated, and had acquired ſo great a degree of putrefaction that no body was able to bear the intolerable exhalation, the horrid ſmell of which ſo much indiſpoſed a hard-labouring-man that he was in danger of preſent death. It is indeed true that the heat of the air in ſummer, even in the moſt ſultry and ſcorching heats, never ariſes to ſo great a degree; but yet it may nevertheleſs appear from hence how much a hot air tends to promote putrefaction. Thus we alſo know that in the ſummer time the fleſh of animals killed very ſpeedily corrupts.

The cure therefore of the acrimony ariſing from this cauſe will be obtained, by removing the cauſe itſelf, and correcting thoſe changes which have been introduced in the body by the heat of the air.

By temperating the heat with cooling exhalations.] It would indeed be extremely dangerous to apply cold ſuddenly to the body, after it has been heated by the air; for nothing does more miſchief than ſudden alterations from heat to cold. Hence in the ſummer-time, when the air is ſuddenly cooled after intenſe heats, often attended with thunder, great rains, and ſometimes hail, pleuriſies, quinſies, and the like inflammatory diſeaſes, invade careleſs people. I ſaw an unhappy man, who to avoid the ſcorching heat of the air, continued for the ſpace of two hours in a deep cellar, being pleaſed with the agreeable, but deceitful coolneſs of the place, for he was taken up almoſt half dead, with a ſtiffneſs throughout his whole body, and afterwards was ſeverely puniſhed for his imprudence by the moſt obſtinate rheumatic pains, from which he with much difficulty eſcaped after ſeveral months. It is therefore neceſſary to temperate the too great heat of the air very gradually, as it may by the power of the phyſician: For cold water drawn up, eſpecially from a deep well, and ſprinkled on the walls and floor, affords a ſafe and pleaſing coolneſs. And ſince it is in our power to increaſe the cold of water almoſt at pleaſure, by adding to it ſea-ſalt, ſal-ammoniacum, and nitre, which ſalts cauſe a great degree of cold in the water during their ſolution, as we learn from chemical experiments, it is therefore evident that thus the too great heat of the air may be eaſily moderated.

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[q] Elem. Chem. Tom. I. pag. 275.

More eſpecially ſome plants ſuitable for this purpoſe.] The celebrated Dr. Hales[r] has demonſtrated by the moſt accurate experiments, that plants drink in and expire again an incredible quantity of water, and therefore this may be the beſt artifice of diſperſing water through the air; as when, for example, branches cut off from a willow are placed in wet ſand. There are alſo ſome plants which exhale an agreeable fragrancy together with water, by which they afford a pleaſing coolneſs: the flowering branches of elder ſerve very well for that purpoſe; but they do not flower throughout the whole ſummer-ſeaſon. Yet many more plants of other kinds may be ſubſtituted in their ſtead; as for example, the barbary-buſh, meadow-ſweet, roſes, *&c.* which abound with ſuch a fragrancy. And thus not only the too great heat of the air is qualified, but as the ſame air is moiſt as well as cool, before it is inſpired and touches the whole ſurface of the body, it will alſo remove the too great drineſs ariſing from heat.

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[r] Vegetable Staticks, cap. 1.

By drinking water ſubacid and a little nitrous.] Too great heat of the air diſpoſes every thing in the body to putrefaction, and therefore ſuch a drink is neceſſary as very much reſiſts putrefaction. But acids have this reſiſting power; and therefore theſe diluted with a large quantity of water, that they may not injure by their ſtimulus when they are very ſtrong, will very well anſwer this intention. A ſmall quantity of nitre is likewiſe added, becauſe it is not only a powerful antiſeptic or cooling medicine, but alſo attenuates the inflammatory ſpiſſitude of the blood, which is feared. Thus a large quantity of water, being taken into the body with theſe ingredients, will be of great ſervice in diluting the humours, and relaxing the veſſels, and will at the ſame time afford a vehicle for the urine, whereby the ſalts and oils already become too acrid, are naturally diſcharged from the body.

Mixed with a little tart wine.] It is a vain fear entertained by ſome, that every thing bad may happen from the uſe of wine in fevers, becauſe it is ſuppoſed that the heat is thereby always increaſed. Strong wines indeed, eſpecially if taken in a large quantity, certainly heat the body too much; but wine diluted with a large quantity of water recruits the languiſhing powers, and yet is not prejudicial by ſtimulating. Even a much more agreeable coolneſs is perceived from the drinking of wine diluted with a great deal of water, than of water only. In ardent fevers Hippocrates[s] orders the patient to be ſupplied with old wine of Thaſos diluted with twenty-five times as much water. But tart wines are more eſpecially recommended here, becauſe they reſiſt all putrefaction: for thus we know that the fleſh of boars being covered with Rheniſh wine is preſerved from corrupting. Add to this, that as people languiſh or faint from too great heat of the air, therefore a moderate quantity of wine diluted with water will very well relieve this complaint, and at the ſame time better diſtribute the water throughout every part. Hence Helmont, in oppoſition to the Galenical phyſicians of his time, who condemned the uſe of all wines in fevers, ſtands up not without reaſon, and ſays, *Vinum autem peculiarem habet indicationem: non ſolum quia vires addit, quibus natura exoſam materiam domat; verum inſuper quod ſit plauſtrum medicaminum conveniens. Eſt nimirum nuntius, qui vias novit, itineri accinctus, charus intimis; & admiſſus in penetralia.* "That wine is peculiarly called for, not "only as it adds to the ſtrength whereby nature "may tame the offending matter, but alſo as it is "the moſt convenient vehicle to the medicines. "It is moreover a meſſenger well acquainted with "the ways, and well provided for the journey it "is to take, beloved and admitted by nature into "her inmoſt receſſes and penetrable parts[t]." Now according to the greater or leſs ſtrength of the wine, it may be diluted with more or leſs water, ſo as to make the moſt agreeable drink: as when, for example,

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[s] De Morbis Lib. III. cap. ultimo pag. 595. Charter. Tom. VII.
[t] Helmont. de Febribus cap. 12. N°. 7. pag. 773.

ample, five or ſix quarts of barley-water are mixed with one part of tart wine, to which is added a ſmall portion of nitre and citron juice, wherein the jelly or juice of currants, elder-berries or the like boiled up with ſugar may be alſo diluted, a form whereof may be ſeen in the *Materia Medica*, at the number correſponding to the preſent aphoriſm.

By ſubacid and balſamic food a very little ſalted.] As the ſtronger decoctions of barley, oats, rice, *&c.* with the additions of the juice of citrons or oranges: likewiſe freſh gathered and tart ſummer fruits, as cherries, currants, ſtrawberries, tart apples boiled, and the like, diſſolved in the preceding decoctions, make an exceeding good and pleaſant food in this caſe. Skimmed milk and the whey of milk boiled with the like fruits are alſo very uſeful. Nor can it be hurtful to add a ſmall quantity of ſalt, more eſpecially in thoſe mealy foods which are diſpleaſing to the taſte without, provided care be taken not to add ſo great a quantity, as will increaſe the febrile motion by a ſtimulus. But if any one has not a good opinion of the uſe of ſalt in theſe caſes, it may be ſufficient to ſeaſon the food only with the juice of citrons or oranges.

And by medicines of the like nature.] Watery liquors are here convenient, inaſmuch as they relax, dilute and mitigate acrimony, while at the ſame time they afford a vehicle to the ſweat and urine for diſcharging out of the body whatever is acrid and offenſive. But water of itſelf too ſoon runs through theſe paſſages, before it has ſufficiently moiſtened the dry parts of the body, which have been parched with heat; and therefore mealy ſubſtances are prudently added to the water, which nouriſh and communicate a mild tenacity; and at the ſame time, by their natural inclination to acidity, they reſiſt all putrefaction. But as by heat the moſt liquid parts of the blood are diſſipated, and the reſt more inclined to thickneſs and coheſion, therefore ſaponaceous diſſolvents are given, but ſuch as are either acid or indeed inclined to acidity, as the juice of elder-berries, currants, mulberries, and many of the like kind, of which there is uſually variety enough to be found at the ſhops of confectioners. But ſince the acrimony of the bile is always obſerved to increaſe by too much heat, ſuch things are alſo commendable, which by a gentle ſtimulus carry off the bilious matter from the primæ viæ, as tamarinds, cryſtals, and cream of tartar, ſal polychreſt, *&c.* If now at the ſame time there is a local inflammation, becauſe the blood deprived of its paſſage ſtagnates in the ultimate extremities of the arteries, then every thing recommended in the cure of an inflammation muſt be uſed; more eſpecially nitre, ſal prunel, *&c.* are here recommended, whoſe cooling virtues are very well known. Hippocrates in this caſe made uſe chiefly of oyxmel, mead and barley-water, which are certainly the beſt, as they are the moſt ſimple liquid medicines. Now from theſe may be formed various other medicines, ſpecimens of which may be ſeen in the *Materia Medica*, at the number correſponding to the preſent aphoriſm.

If now violent exerciſe of the body concurs together with too much heat of the air, the moſt malignant and dangerous fevers ariſe, as frequently happens when ſoldiers are obliged to make long marches in the ſcorching ſummer heats: for then commonly happen very putrid and ſpreading camp-fevers, in which the ſame diet and remedies, as before mentioned, are proper. Hence it was a ſalutary cuſtom among the ancients to make the ſoldiers drink vinegar and water to prevent theſe diſeaſes: And ſometimes the generals have given ſtrict orders for no wine to be drank by any body in the expedition, but for every one to be content with vinegar.[u]

3. Thoſe which ariſe from a too moiſt air are to be cured with large fires made of reſinous and aromatic woods, and alſo by the exhalations of ſpices.

That the air is always moiſt, and contains water in itſelf, although it may ſeem dry, we are taught by thoſe bodies which deſerve to be termed watery magnets, becauſe they attract water from the air: ſuch are the ſtrongeſt acids, as rectified oil of vitriol, very dry alcaline ſalts, decrepitated ſea-ſalt, *&c.* for all theſe being expoſed to the air in the ſummer-time, however warm and dry it may ſeem, do nevertheleſs increaſe their weight and diſſolve; and one may then be able to diſtil over by the force of fire all that they attracted from the air, which, for the moſt part, is only meer water. But when water abounds in the air, it is then ſaid to be too moiſt: but the different degree of moiſture is pointed out to us by hygroſcopes. But now different changes will happen in the human body according as this moiſture of the air is accompanied either with heat or cold. For a cold and moiſt air, with reſpect to the water which it contains, and applies in a great quantity to the ſurface of the body, will diſſolve and relax, while in the mean time the cold contracts and ſhuts up the mouths of the exhaling veſſels, ſo as to obſtruct the perſpiration, and cauſe a ſerous defluxion internally, whence coughs, catarrhs, ſerous peripneumonies, *&c.* But if the moiſture of the air is accompanied with great heat, it

[u] Nonnius de re cibaria Lib. IV. cap. 15. p. 479.

it excites the moſt ſudden putrefaction, as is evident in the fleſh of dead animals, which being expoſed for the ſpace of a day or two in ſuch an air, diſſolve into a putrid maſs. Hence it is, that phyſicians have in all ages condemned a warm and moiſt air, as containing ſomething of a peſtilential quality. Thus it has been obſerved, *Europæos, qui loca Americæ primi obſidebant, omnes fere morbo Endemico periiſſe per malignum morbum, qui corpora breviſſime diſſolvebat putrida quadam febris ſpecie. Id autem imprimis accidiſſe illis omnibus, qui loca incolebant arboribus & fruticibus obſita* [w]. "That "the Europeans, at the firſt ſettling of their co-"lonies in America, moſt of them periſhed with "a malignant epidemical diſtemper, reſembling a "kind of putrid fever, which diſſolved the bodies "in a very ſhort time. But this happened more "eſpecially to all thoſe who inhabited places a-"bounding with trees and ſhrubs." For trees and other plants exhale an incredible quantity of water: and therefore afterwards, when they had removed this exhaling humidity by burning up the woods, the air was rendered perfectly healthy, although the climate continued equally hot as before.

Since therefore this moiſture of the air is ſo prejudicial, it ought to be particularly corrected, as it may be more eſpecially by fire, which effectually dries every thing; and particularly a fire made with aromatic and reſinous woods, ſuch as guaiacum, maſtic, juniper, cedar, and the like; for by this means there is alſo diffuſed through the air at the ſame time that excellent antiſeptic acid, reſiſting putrefaction, which, as we are taught by chemiſtry, lies contained together with the aromatic fragrancy in theſe woods. But if theſe woods bear any conſiderable price, the chips and fragments left after working of them may ſerve for this purpoſe: otherwiſe oak-wood alone, which may be had at a price cheap enough, will ſuffice for this indication. It will indeed ſeem improper to kindle a fire when the air is already very hot, but if this be done in a arge and open chimney, the heat will not be ſo much ncreaſed, and in the mean time the too great moiſture of the air will be carried off very well.

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[w] Boerh. Elem. chem. Tom. I. pag. 620.

But aromatic exhalations, though properly ſpeak-ng, they do not leſſen the moiſture of the air, yet hey prevent or correct a great many maladies ari-ing from a too great moiſture of the air, as the cauſe. For the corroborating force of ſpices cor-ects the too great relaxation, and at the ſame time powerfully reſiſts all putrefaction. Thus it is a known thing that ſouthernwood, wormwood, ger-mander, rue, ſage, and the like herbs, reſtrain pu-refaction in the dead bodies upon which they are prinkled; and parts corrupted by a gangrene or a phacelus may be preſerved by ſuch medicines, ſo s to prevent the diſorder from ſpreading. For this purpoſe therefore it is cuſtomary to fumigate the air by burning maſtic, frankincenſe, myrrh, *&c.* or he moſt fragrant ſpices being reduced to a powder re diſperſed about the place; a formula or pre-cription of which powder may be ſeen in our au-hor's *Materia Medica* correſponding to this number.

4. Such as ariſe from an acrid putrefying air muſt be corrected by the firing of gun-powder or nitre, the ſteams of vinegar, or the ſprinkling of common ſalt upon burn-ing coals.

By the air we underſtand that thin fluid with which e are inveſted on all ſides, and whoſe gravity, laſticity, and other general qualities have been beautifully ſearched out and examined experimentally by mechanical philoſophers. But in this ambient air fluctuate a very great number of different ſubſtances: for every thing which exhales both from vegetables and animals, all that flies off from corrupting dead bodies, and every thing which is expelled from bodies of any kind by the force of fire, all diffuſe themſelves throughout the air. Nor muſt we exclude the exhalations thrown into the air from foſſils, either ſpontaneouſly or by the force of fire. Hence the air is, in a manner, a chaos in which the minute particles of all theſe bodies fluctuate together; and therefore, with reſpect to the variety of bodies which the air contains, it may produce wonderful effects, more eſpecially becauſe it is every where preſent. For, as Hippocrates ſays, *Quid enim ſine hoc fit tandem? Aut a quonam hic abeſt, aut cui non præſens eſt?* "What is "there that can be done without the preſence of "the air? What place is free from it, or whither "does it not penetrate[x]?" But more eſpecially the air has a great efficacy upon the human body, not only as it inveſts the external ſurface thereof, but alſo as it is inſpired every minute into the lungs and conveyed through the ſtomach and inteſtines filled with all its various particles, as long as life continues. Hence [y] Hippocrates ſays, *Corpora hominum & aliorum animantium triplici alimento nutriuntur: illis autem alimentis hæc ſunt nomina cibi, potus, ſpiritus. Ac ſpiritus quidem, qui in corporibus inſunt, flatus nominantur, qui verò extra corpora, aër. Ille autem maximus in omnibus, quæ accidunt, auctor eſt*, &c. "That the bodies of "men and other animals are nouriſhed by three "ſorts of aliment, of which theſe are the names

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[x] Hippocrat. de flatib. cap. 2. Charter. Tom. VI. pag. 21

[y] Ibidem.

" food, drink, and air. And the air which is " confined in bodies is called flatus, to diſtinguiſh " it from the air, properly ſo called, which is " without the bodies. But this is the great author " of all thoſe changes which happen in bodies, " *&c.*" Hence phyſicians have in all ages ſought after the cauſes of diſeaſes, ſpreading among the people, in the air with which we are encompaſſed, *Quia eundem ſpiritum omnes attrahunt, & ſimili corpori ſpiritu ſimiliter permixto ſimiles oriuntur febres.* " Becauſe every one draws the ſame breath, " and the ſame air being mixed in the ſame man" ner with the bodies of people, the ſame fevers " ariſe [z]."

But this latent malignity in the air is known only by its effects, and cannot eaſily be reduced to any known ſpecies of acrimony. But ſuch an air is ſaid to be ſharp or acrid, becauſe by that the ſtimuli are communicated to the human body, by which the humours are moſt violently moved, and thrown into a moſt acute fever; and at the ſame time there is uſually in ſuch an air a diſpoſition often to a very ſudden and great putrefaction, for which reaſon ſuch an air is ſaid to be putrefying. Some indeed would have this malignity of the air more particularly defined; but in attempting this they do not ſeem to have happily ſucceeded. Thus, when malignant diſeaſes have been obſerved to ariſe from the putrid exhalations of dead bodies after a battle, ſome have therefore taken occaſion to pronounce from thence, that putrid exhalations diſperſed through the air were always the cauſe of ſuch like diſeaſes. But they who tan or prepare the ſkins of animals, and ſuch as make glue of the parts of animals, breathe an air filled with ſuch putrid effluvia all their life-time, and yet continue well

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[z] Hippocrat. de flatib. cap. 3. pag. 215.

well enough in health. Arſenic being obſerved by the chemiſts to be a moſt ſtrong poiſon to all animals; when it has been rendered volatile by fire, therefore they have accuſed ſuch arſenical fumes floating in the air as the epidemical cauſe. Others again have framed different hypotheſes no better than conjecture, not being founded on facts and experiments. For who has been able to explain, why the plague at one time invades men only, at another time only cattle, particularly oxen, or confining itſelf to ſome other particular claſs of animals; though all in general breathe the ſame air. Hippocrates contented himſelf with obſerving the effects, and though he did not underſtand the cauſes; yet, after propoſing this difficulty, he wiſely ſays, *Corpus a corpore, natura a natura, alimentum ab alimento differt. Neque enim omnibus animantium generibus eadem ſunt commoda aut incommoda, ſed alia aliis conveniunt. Quum igitur aër hujuſmodi inquinamentis plenus fuerit, quæ humanæ naturæ inimica ſunt, tum homines ægrotant. Quando vero alteri cuidam animantium generi aër incommodus fuerit, illud morbo laborat.* "The nature of one body "differs from another, and even nature differs from "herſelf in the ſame body at different times, and "one ſort of aliment differs from another; nor "is every thing indifferently hurtful or uſeful to "all ſorts of animals alike, but ſome things agree "or diſagree more with ſome than others. When "therefore ſuch a kind of air is full of foreign "particles, which are enemies to human nature, "then mankind are invaded with ſickneſs. But "when the air becomes incommodious to ſome "other kind of animal, that ſpecies alſo becomes "invaded with diſeaſe[a]." This ingenuous ſim plicity of the antients has been too preſumptuouſly laughed at by ſome, who at the ſame time have recourſe to occult qualities: but the antients did not attempt to account for thoſe things which they did not underſtand, but being ignorant of the cauſes, they yet obſerved what were the effects, and diſtinguiſhed them by ſuch a denomination.

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[a] Hippocrat. ibidem.

It will now be of the greateſt uſe to ſee what phyſic has found out to deſtroy theſe latent poiſons in the air, or render them inactive, or elſe ſo to defend human bodies, that they may be either leſs or not at all affected by theſe cauſes. The antient chemiſts have pronounced fire to be the death of all things, ſince thereby all the ſeminal faculty or particular form is deſtroyed. And we are taught by the moſt antient monuments of antiquity, that by fire only, they have at times endeavoured to deſtroy this latent poiſon in the air. For it is related in Suidas[b], *Quod Jachen Ægyptius*, (qui diu ante *Hippocratem* vixit) *in doloribus & morbis curandis ſummus fuerit artifex, & peſtim graſſantem extinxerit, &c. quamobrem & ſumptuoſe ſepultus fuit. Poſtea autem, quando popularis morbus graſſabatur, ad hujus fanum ſacri ſcribæ euntes, & ſacris ritè peractis ex ejus ara ignem accedentes, & pyras per urbem incendentes, & fœtidi aëris corruptricem illum morbum exſiccantes & ſuperantes, quod profecto maximæ novitatis eſt, morbum illum igne exſtinxerunt.* "That Jachen the Ægyptian, "who lived a long time before Hippocrates, was "a great artiſt in the cure of pains and diſeaſes, "and that he extinguiſhed a ſpreading peſtilence, "*&c.* for which reaſon he was ſumptuouſly buried. "But afterwards that when an epidemical diſeaſe "ſpread, the prieſt went to his temple or tomb, "and after regularly performing their ceremonies,

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[b] Ad vocabulum 'Ιαχήν & ἱερογραμματεῖς.

“ they kindled fires in the area round about, and “ made bonfires throughout the city; ſo that by “ drying up and changing what was fœtid, corrupt, and morbid in the air, they ſuppreſſed the “ diſeaſe by fire, which is indeed a thing perfectly “ new or unheard of.” The ſame is alſo teſtified by Plutarch[c] of the phyſician Acron, who alſo lived before Hippocrates, when he ſays, *Etenim Medici adverſus peſtilentiales effectus prodeſſe cenſent multam flammam, utpote aërem attenuantem. Melius autem attenuat, ſi bene odorata ligna urantur, qualia ſunt cypreſſi & juniperi & piceæ. Acronem vero Medicum Athenis tempore magnæ peſtis gloriam ſibi paraviſſe dicunt, jubentem ignem prope ægrotantes accendi: juvit enim non paucos.* “ For fire or “ flame is judged to be of much ſervice by phyſicians againſt the effects of the plague, becauſe “ it attenuates the air: but it will do this better if “ good ſmelling woods are burnt, ſuch as cyprus, “ juniper, pitch tree, *&c.* But Acron a phyſician at Athens, is ſaid to have gained great fame “ in the time of a great peſtilence, by ordering “ a fire to be kindled near ſuch as lay ill; for it relieved a great many.” That the ſame was likewiſe done by Hippocrates, is alſo recorded by Galen[d] and Aëtius[e]. Galen adds, that Hippocrates did not order the fires to be made throughout the city with any ſimple kind of fuel, but that he likewiſe added Garlands and the moſt ſweet-ſmelling flowers, with fragrant ointments, that the people might by this means breathe the air purified. Since therefore the moiſture of the air is often ſo pernicious, if joined with heat, (ſee N°. 3.

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[c] In fine libri de Iſide & Oſiride Tom. II. pag. 383.

[d] De Theriaca ad Piſon. Lib. I. cap. 16. Charter. Tom. XIII. pag. 935.

[e] Lib. V. cap. 94. pag. 91. verſa.

preceding,) as it may be thus corrected, it is evident that a happy event may be expected from this method. Thus it was obſerved in the Ephemera Britannica, or Engliſh ſweating-fever, that Blackſmiths and cooks were ſaved by their fires, and remained free from this peſtilential diſorder[f].

But if this virus floating in the air be moved along with it by the winds, it may be conveyed from one place to another. Thus we read * that Empedocles having ſhut up the opening betwixt the mountains through which the violent and unhealthy ſouth-wind blew into the plain country, he by that means excluded the plague. *Et Varro, cum Corcyræ eſſet exercitus ac claſſis, & omnes domus repletæ eſſent ægrotis ac funeribus, immiſſo feneſtris novis aquilone, & obſtructis peſtilentibus, januaque permutata, cæteraque ejus generis diligentia, ſuos comites, ac familiam, incolumes reduxit.* "And "when Varro was at Corcyra with his fleet and "army, finding all the houſes full of ſick and "dead people, by letting in the north wind at new "openings, and obſtructing the peſtilential air, "with changing the gates, and other diligences of "the like kind, he by that means brought back "his family and attendants in ſafety[g]." We alſo read in Homer[h], that when Apollo was pacified and pleaſed to free the Grecian army from the plague, he ſent a violent wind. For many obſervations have taught us that noxious and poiſonous bodies may lie in the air, which ſtagnates or continues a long while in the ſame place; but that they may be ſo diſſipated only by moving the air,

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[f] Joh. Caji. Britanni de Ephem. Britan. p. 89.

* Plutarch. de Curioſitate in initio. Tom. II. pag. 515. C. & adverſus Colotem circa finem. ibid. pag. 1126. B

[g] Scriptores rei ruſticæ Varro Lib. I. cap. 4. Tom. I. pag. 151.

[h] Iliad. Lib. I. pag. 21.

either by the winds or other cauſes, as to be no longer hurtful. Thus, after an eruption of the vulcano in mount Veſuvius, the atmoſphere is obſerved to be infected to a certain height from the earth; and that this malignity continues a long time in the ſame place, killing all animals and even plants. But in the mean time, ſuch places are not to be diſtinguiſhed by any ill ſmell or other ſenſible quality, except that by attentively viewing, there appears to the eye a ſort of undulation in the air, almoſt like that which is perceived in the air which ſurrounds burning coals; and the light of a candle placed in this air, is ſoon extinguiſhed. The only remedy is to diſſipate theſe exhalations by moving the air either by wind, or the firing of cannon [i]. The ſame thing has been alſo frequently obſerved in the digging of deep wells, ſo that workmen are now become cautious, and by letting down a candle firſt, they try whether any malignant damp lies concealed; and if the candle is extinguiſhed, they diſſipate and diſcharge the confined damp or poiſonous effluvia, by throwing down a granade, or ſomething of the like kind, and afterwards they deſcend with ſafety.

But beſides theſe two ways of correcting the air, namely, by fires, and the violent motion of it by winds, others have endeavoured to correct and deſtroy the activity of the latent poiſon by diffuſing certain vapours through the air. There may poſſibly be ſpecific antidotes to theſe poiſons ſubſiſting in the ſtores of nature, though they are as yet unknown, becauſe this poiſon in the air does not diſcover itſelf by any ſenſible qualities, but appears almoſt only by its effects. But in the mean time, it ſeems certain that this unknown matter in the air, diſpoſes all the humours to a very bad and ſudden putrefaction. In the dreadful plague of Athens which Thucydides has deſcribed, the breath of the patients immediately ſtunk intolerably in the very beginning of the diſeaſe. And we read in Hippocrates [k] that in the frightful eryſipelas which ſpread epidemically after the moiſt ſouth wind, all the ſoft parts were ſo diſſolved with a true putrefaction, that the whole thigh, leg, and foot, were laid naked. In the camp-dyſenteries, the fœces ſmelled cadaverous, *&c.* and therefore remedies have in theſe caſes been fetched in all ages from ſuch things as the moſt effectually reſiſt putrefaction, partly with a view to correct this putrefying and fluctuating poiſon in the air, and partly to arm and ſecure the human bodies againſt it, by rendering them the moſt averſe to all putrefaction. Therefore ſome have recommended the agreeable exhalations of ſpices, but more eſpecially acid vapours, which are certainly the moſt averſe of any thing to putrefaction.

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[i] De Caſtera Hiſtoire du Mont. Veſuve. pag. 296, &c.

Therefore vinegar expoſed to the fire in broad veſſels or plates, and reſolved into vapours, is a capital remedy in this caſe. Nitre or ſea-ſalt ſprinkled upon burning coals, are reſolved into very moveable acid vapours, which never ceaſe moving if they are pure, as we are taught by chemiſtry. Thus therefore the moſt effectual correctors of all putrefaction, will be every way diffuſed. But ſulphur or brimſtone above all other things, has been recommended for this uſe from the earlieſt antiquity with the greateſt advantage. It is not without reaſon, that ſome phyſicians of the greateſt note, have wondered that ſuch extraordinary virtues ſhould lie concealed in this ſoft and inſipid body; for the very worſt poiſons loſe their force only by melting with ſulphur. White arſenic, than which there is hardly a ſtronger poiſon, being melted with an equal quantity of ſulphur over a gentle fire, becomes ſo much weakened, that it may be taken to the quantity of a whole dram by a dog without damage. The regulus of antimony, a few grains of which will often purge the ſtrongeſt man both upwards and downwards with the greateſt violence and anxiety, being fuſed with an equal quantity of ſulphur, is rendered unactive: crude mercury ground with ſulphur by a long continued trituration, or intimately united with the ſulphur, by melting over the fire, loſes the great activity which it before poſſeſſed [l]. The fumes of burning ſulphur ſtop and prevent the moſt violent fermentation, and moſt powerfully reſiſt all manner of putrefaction. When Achilles took out the drinking cup which was allowed to be uſed by none but Jove, he firſt depurated it [m] with ſulphur before he uſed it, becauſe it was known that air long confined often contains ſomething of malignity. And when the habitation of Ulyſſes continued in blood and ſlaughter from the killing of his nobles, before he would change his cloaths, he purified the houſe with the fumes of burning ſulphur, and called it the cure of evils.

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[k] Epidem. 3. Charter. Tom. IX. pag. 265.

*Οἶσε θέειον γρηὺ κακῶν ἄκος οἶσε δέ μοι πῦρ*
*Ὄφρα θεειώσω μέγαρον* [n].

But the vapours of burning ſulphur have this inconvenience, that being imprudently drawn into the lungs, it may ſuffocate, and thus it can deſtroy almoſt all kinds of animals. But when ſulphur is mixed with nitre, it very readily turns into flame, and does not yield ſuch ſuffocating fumes; whence it is evident that gun-powder happily anſwers this intention: for this being made, as it is well known, of nitre, ſulphur and charcoal, very readily takes fire, and the fumes hence made ſpeedily diffuſe themſelves throughout the air, nor does the vapour thereof ſuffocate, but is rather of an agreeable ſmell. Helmont teſtifies [o], *Quod viderit, in Cataracta Gandavenſi integram legionem Neapolitanam peſte periiſſe. Erat autem ibidem cohors Germanorum, quæ pulvere pyrio ſua tinxerat induſia, ut lotrices, ſimulque pediculos excuſarent. Horum ſi qui perirent, id præ dyſenteria, non autem peſte.* "That he ſaw a whole legion of the Nea-" "politan army periſh of the plague in the cata-" "ract of Ghent. But there was at the ſame time" "a regiment of German ſoldiers who had fumi-" "gated their cloaths with gun-powder to dry" "them, and to drive out the lice. But if any of" "theſe laſt periſhed, it was with a dyſentery, and" "not with the peſtilence." This effect is therefore to be much more expected from the gun-powder, when it alſo moves the air powerfully by the force of an exploſion; and at the ſame time the flame diſperſing itſelf at large, dries and purifies it as well as puts it in motion, and by repleniſhing the ſame with acid vapours, it becomes the moſt averſe to all putrefaction.

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[l] Freder. Hofmanni Obſerv. Phiſico-chem. pag. 277, 278.
[m] Homer. Lib. XVI. Illiad. pag. 297. [n] Homer. Odyſſ. in fine Lib. XXII. pag. 318.

5. When the irritation ariſes from paſſions of the mind, thoſe paſſions are to be quieted by reaſoning, by paſſions of a contrary nature, by a variety of objects, anodines, and opiates.

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[o] Tumulus Peſtis in Capitulo, Hippocrates redivivus pag. 888.

See what has been ſaid in the commentary to § 104, concerning the moſt efficacious remedies, whereby the paſſions of the mind may be either quieted or leſſened, when they are the cauſe of too quick a circulation. It is evident from what Sanctorius[p] has ſaid, concerning the paſſions of the mind, what great alterations are capable of being made by them in the moſt healthy body; and he very well obſerves[q], *Paſſiones animi non medicinis, ſed alia paſſione contraria ſuperari. Ira enim & ſpes auferunt timorem, & lætitia mæſtitiam.* "That "paſſions of the mind are to be cured not by me"dicines but by contrary paſſions; for anger and "hope remove fear, as joy diſpels ſorrow." But paſſions of the mind are injurious, not only inaſmuch as a fever may ariſe from thence without any other cauſe, but alſo as they diſpoſe the body to be more eaſily affected by the other cauſes of diſeaſes. Diemerbroek obſerves in his obſervations on the plague, that thoſe who were moſt afraid, were ſooneſt taken with it. And in his account of his own way of living, by confiding in which he boldly viſited thoſe who lay ill of the diſeaſe, he affirms, that himſelf remained free, and that he carefully avoided all paſſions of mind as much as poſſible, ſo that he lived free and without fear in the midſt of a thouſand who died. But if at any time he became ſorrowful, which was hardly to be avoided in ſo deſperate a calamity, he waſhed away his cares with wine 'till his ſpirits were revived, ſince nothing good could be expected from grieving at the common calamity[r].

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[p] Ab Aphoriſmo 456. ad finem uſque. [q] Aphoriſm. 467.

[r] Diembroek de Peſte, Lib. II. cap. 12. pag. 147.

6. That which ariſes from acid acrid food is to be remedied by diluting, obtunding, abſorbing, or changing it into a neutral ſalt by watery liquors, jellies of animals, oily medicines, powder of chalk or oyſter-ſhells, animal ſtones, fat earths, fixed and volatile alcaline ſalts, either alone or compounded with other things, (ſee what has been ſaid before § 60, to 69.)

Acid acrid foods are thoſe which are ſo either before they are taken into the body, or ſuch as being mild and ſweet when they are firſt taken in, do afterwards ſpontaneouſly degenerate into this kind of acrimony, from too great a weakneſs of the changing powers. But from theſe acrids may ariſe fevers, whether they were taken in under the denomination of food, drink, ſauces, medicines, or poiſons (as we ſaid before in the comment to § 586. N°. 1.) But the cure of this acrid is effected

By diluting.] Which can be only obtained by water, or by ſuch things as have water predominating. But how much good may be expected in weakening the ſtrongeſt acid acrimony by diluting only, we are taught in a remarkable inſtance by Sydenham[s]. "An unfortunate man, melan-"choly with love, had taken a large quantity "of corroſive ſublimate; and when this moſt ſharp "poiſon had lain almoſt a whole hour in his body, "with his mouth and lips very much ſwelled, "and moſt excruciating pain at the ſtomach, Sy-"denham being called, immediately ordered a "large quantity of warm water to be taken and "re-

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[s] Epiſtola I. reſponſor. pag. 404.

"repeated again as ſoon as the firſt water was diſ-"charged out of the ſtomach; and at the ſame "time he ordered a large quantity of warm water "to be injected by way of clyſter The patient "now being deſirous of life immediately obeyed, "and drank a much larger quantity of water than "his phyſician had ordered, and by that means "was in a few hours time freed from the moſt im-"minent danger of death, only the ſwelling of his "lips did not immediately ſubſide, and his mouth "continued ſore and ulcerated; which maladies "however went off in four days time, only with "the uſe of a milk-diet." Hence it is evident how uſeful diluents only may be in diluting acrimony. But when what was taken into the body degenerates into an acid acrimony from too great a weakneſs of the ſtomach and inteſtines, diluents are then hurtful, inaſmuch as they leſſen the ſtrength of theſe parts already weakened, (as was ſaid before in the comment to § 66.)

Obtunding, abſorbing, *&c.*] When we treated of diſeaſes ariſing from a ſpontaneous acid humour, (§ 60 to 69.) we explained the various ways whereby an acid might be rendered unactive, or elſe changed into another nature. For the firſt is performed either by enveloping the acrid particles with oily ſubſtances, or by ſo arming the parts that acids cannot act upon them, Acids are attracted by all earthly abſorbents, and uniting together with them, or with alcaline volatile or fixed ſalts, the acids are changed into a ſalt called neutral or compound, as being formed both of acid and alcali joined together: and theſe neutral ſalts are always mild, even though formed of the ſtrongeſt acid and alcali, as we ſee evidently in vitriolated tartar. The gelatinous parts of animals are recommended for this purpoſe, ſuch as, for example, jelly of hartſhorn, ivory and fleſh-broths boiled to a trembling conſiſtence, partly becauſe they defend and envelope the acrid parts by their mild glutinoſity, and partly becauſe they naturally incline to an alcali: thus alſo oily ſubſtances are ſerviceable by enveloping, together with fat earths, ſuch as the boles, ſealed earths, *&c.* which allay all acrimony by their mild unctuoſity. Yet theſe earths neither abſorb nor change the acid, for as far as I have been able to obſerve, they do not effervefce with acids; but even chymical experiments rather teach that an acid itſelf lies concealed in theſe earths (ſee § 88. N°. 5.) Concerning all the other correctors of acids we before treated, and determined the doſe and method wherein they ought to be given to act with ſafety and efficacy, But more eſpecially all theſe are uſeful in the tender age of infants, or in very weak people living on aceſcent foods, in which fevers often ariſe from an acid acrimony; but the other kinds of fevers ſeldom owe their origin to this cauſe.

7. That irritation ariſing from acrid ſaline foods is to be remedied by diluting the acrimony with watery drinks, and by evacuating the ſame, and alſo by ſheathing thereof by viſcid and oily ſubſtances, and by correcting with lixivious medicines from quick-lime.

Sea-ſalt, and in ſome places ſal-gem, which is very like unto ſea-ſalt, is cuſtomary to be mixed with the food, to give it an agreeable reliſh, and frequently to prevent any corruption; for it is well known that fleſh and fiſh, bread and many other kinds of food are preſerved with ſalt. But ſea-ſalt has this property, that when it has entered the blood, and circulates together with it through the veſſels, it is hardly at all changed by the powers of the body, but is diſcharged unaltered in the urine; and therefore in the urine of animals uſing ſea-ſalt, after all the more volatile parts have been expelled by forcible fire, the ſea-ſalt continues in the remaining fœces[t]. From whence it is evident that a more plentiful uſe of the ſea-ſalt makes a ſtimulus which the powers of the body are not able to conquer, nor yet to alter, and therefore it is no wonder fevers ſhould be thence excited. It is indeed ſeldom that ſo great a quantity of ſea-ſalt is taken at once, as to be able to excite a violent fever by its ſtimulus; but thoſe who delight too much in ſalted meats, or who are obliged to live upon them from the ſcarcity of freſh proviſions, as often happens aboard a ſhip, from that cauſe they ſometimes fall into the ſcurvy called muriatic, and the worſt fevers ſometimes ariſe from thence, when the quantity of ſalt daily taken in is neither ſubdued by the powers of the body, nor entirely expelled, but continues in the blood, and inſinuating itſelf into the oily and earthy parts of the blood, adheres very obſtinately, and therefore irritates life by a conſtant ſtimulus which is not eaſily to be effaced. For ſea-ſalt may be embodied in fat ſubſtances, as appears in bacon and other fat ſalted meats, ſo that it cannot be extracted but by a long maceration and with the greateſt difficulty.

The principal remedy for fevers ariſing from this cauſe is diluting with watery drinks, which nature calls for of her own accord; for if any one eats too much ſalt, intenſe thirſt ariſing ſoon after obliges him to drink plentifully, whereby the ſalt is waſhed out from the blood, and commodiouſly expelled by the urinary paſſages. But as ſailors in long voyages are obliged to live entirely upon ſalt-meats, and have often either a ſcarcity of water, or ſuch a corruption as renders it diſagreeable, therefore too great a quantity of ſea-ſalt continues mixed with the blood, and will be afterwards very difficult to be waſhed out. Since therefore in this caſe there is a muriatic acrimony in the humours which often occaſions the very worſt pains, it will be uſeful to mix oily ſubſtances with diluents, inaſmuch as they ſheath and mitigate all acrimony.

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[t] H. Boerhaave, Chem. Tom. II. pag. 313, & 326.

But when ſea-ſalt is ſo intimately mixed with the oily and earthy parts of the blood that it cannot be waſhed out, the beſt remedy then to be had is a lixivium of quick-lime made by pouring ſix or eight times as much water upon it, more eſpecially the quick-lime made of Leyden ſtone, and afterwards to clarify the decanted liquor by filtration. How much quick-lime is able to effect towards the purification of ſalts which are rendered foul with oils, the chemiſts well know, who depurate the volatile alcaline ſalts prepared from the parts of animals from their fœtid oil, by ſubliming them from quick-lime, nor can they be rendered purer by any artifice. But it is alſo well known that quicklime being thrown into recent urine, immediately cauſes it to exhale a ſaline vapour which pierces the noſe like a flaſh of fire, and which being collected by a ſlow diſtillation in cloſe veſſels, forms a very ſharp and volatile liquor, of an intolerable fiery ſmell [u], and therefore the uſe of lixivium of quick-lime is very juſtly ſuſpected; for if it produces the like fiery and volatile ſpirits in the body, the tender threads of the encephalon and nerves are deſtroyed. We read that the oxen which by accident drank a very ſtrong lixivium of quick-lime, died ſome time after [w]. But experience teaches us that the uſe of lixi-

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[u] Idem ibidem, pag. 315.

[w] Academ. des Sciences, l'An. 1700. Mem. pag. 158.

lixivium or quick-lime is not ſo fatal if it is prudently adminiſtered. The incomparable phyſician Burlet [x], who adminiſtered this lixivium frequently and in various diſeaſes, teſtifies that it did not always anſwer the great encomiums given of it; but in the mean time he did not obſerve any ill effects to come from it: and he obſerves that the exhibition of it was leſs uſeful in the ſame diſeaſes in France than in Holland. But it was cuſtomary with him to give nine ounces of this ſtrong lime-water in a day to young and robuſt patients mixed with an equal quantity of milk, ordering the patient to take a third part of the whole every four hours; but he affirms that the daily uſe of this medicine was ſerviceable in dyſenteries and aſthma's, continued in dyſenteries for eight days, and in aſthma's for a month. He had recourſe to this medicine in many other diſeaſes, but only learnt from them that its uſe was not ſo dangerous; but ſometimes they who uſed this lixivium or lime-water loſt their appetite entirely, and complained of a troubleſome weight preſſing at the ſtomach, from whence they were obliged to intermit the uſe of it for ſome days. I remember myſelf to have ſometimes given the ſame quantity of lime-water without any damage thence following. But in the mean time the uſe of this medicine ought to be ſuſpected in men of a warm habit, or afflicted with inflammatory diſeaſes, or if certain ſigns appear of putrefaction; but in phlegmatic, cold and acid indiſpoſitions, it may be of great ſervice, and is more eſpecially recommended for extricating the more fixed muriatic ſalts mixed with the blood [y]. But when this lixivium or lime-water is adminiſtered, the patient's urine ought to be daily examined, to ſee if any ſigns of putrefaction can be found in it; for, ſince the more acrid ſalts are waſhed out from the blood in the urine, it will beſt appear therein whether any alteration is made in the ſalts of the blood by the lime-water. But if ſuch an appearance is found, the patient ſhould abſtain from any further uſe of it.

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[x] Ibid. pag. 167, 168.

[y] H. Boerh. Chem. Tom. II. pag. 316.

8. The irritation ariſing from acrid, aromatic and heating foods is to be remedied by diluting with watery drinks, by correcting with acids, by diſſolving and cleanſing with ſaponaceous acids, and by ſheathing or mitigating with ſoft gelatinous ſubſtances. Hitherto belong alſo what relates to alcaleſcent acrids, and hence the cure of them likewiſe is intelligible.

They who make hunger their beſt ſauce to food, ſeldom have a fever from this cauſe; but thoſe who have a weak ſtomach, from gluttony and drinking, require theſe incentives to give them an appetite to eat: and therefore, there is ſuch a great variety of ſauces provided among the rich, and containing moſt of them the very ſharpeſt ſpices. But now as all theſe are very uſeful in languid and cold diſeaſes, by increaſing the motion of the humours and warmth of the body, ſo on the contrary in healthy people, and eſpecially thoſe of a warm temperament, the moſt acute fevers often ariſe from the abuſe of them. It is well known from chemiſtry, that the moſt agreeable ſpicineſs of cinnamon, which is concentrated in its diſtilled oil, burns the tongue and excites a true inflammation. The ſame is alſo true of cloves and moſt

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other ſpices, though in a leſs degree. No wonder therefore if fevers ariſe from an imprudent uſe of ſpices. But the remedy for fevers about to ariſe from this cauſe, will be in every thing capable of removing or weakening theſe ſtimuli. But this is done

By diluting with watery drinks.] For if that very ſharp oil of cinnamon, which like actual fire burns the tongue, be ground with ſugar, and mixed with water, it may be at pleaſure ſo diluted as to become at length inactive. For water has this property, that it enervates every thing acrid capable of being diſſolved in it, while the acrimony is equally diſtributed throughout its whole maſs; and by thus diſperſing them it occaſions little or no action to be exerted by ſuch things which having been concentrated together powerfully ſtimulate. Therefore every one who has taken a large quantity of ſuch ſubſtances grows thirſty, nature pointing out the way whereby the diſorder may be moſt commodiouſly conquered. Hence alſo great drinkers are delighted with ſpices, becauſe making them thirſty they may be able to drink with more pleaſure.

By correcting with acids.] For the agreeable coolneſs which acids introduce throughout the body, leſſens the heat ariſing from ſpices, and at the ſame time corrects or leſſens the aromatic acrimony itſelf. The pods of the moſt burning pepper of Braſil called capſicum, being infuſed in vinegar become mild, and the moſt ſharp muſtard-ſeeds being ground with vinegar become palatable, and the ſame is true almoſt of all other ſpices. Hence the juice of citrons, oranges, vinegar and the like, given with diluents are of the greateſt uſe.

By diſſolving and cleanſing with ſaponaceous acids.] In moſt ſpices that acrimony which is in its own nature very volatile is wrapped up in a tenacious oil, and by that means adheres very firmly to the parts of bodies, ſo as not to be eaſily waſhed out by watery liquors only. The cure of ſuch an acrimony therefore requires a diviſion of the oily tenacity in which the irritating acrid is lodged, which can be well obtained by nothing ſo much as by ſaponaceous ſubſtances, eſpecially ſuch as are either acid, or inclining to be ſo for the reaſons laſt mentioned. For it is ſcarce credible how obſtinately that aromatic acrimony adheres, ſo that it cannot be waſhed or diluted out by any thing watery, more eſpecially in ſpices that have this acrimony wrapped up in a more fixed oil. The fragrancy of cinnamon, for example, flies off in vapours of boiling water, if they are not confined in cloſe veſſels; and even the oil of cinnamon being ſhook a long time together with water, loſes its ſtrength: but it is otherwiſe in pepper, from whence is drawn an oil by diſtillation, which ſmells with the fragrancy of pepper, but affords no acrimony to the taſte. The remaining decoction is indeed acrid enough, and yet the grains of pepper themſelves retain ſo hot a taſte, that they do not ſeem to have loſt any thing; nor have I been able to waſh out this acrimony of the pepper, even though the boiling be continued a long while, and repeated to the eighth time, and in a very large quantity of water, although they ſeemed to be reduced to the ſoftneſs of a pulp by ſo many boilings. It is therefore evident enough that ſuch an acrimony of many ſpices cannot be removed by diluents only. The ſaponaceous juices of ripe garden fruits being poſſeſſed of ſuch a diſſolving power, are in this caſe more eſpecially uſeful. It is well known that the expreſſed juice of ripe grapes drank plentifully, diſſolves all the humours, and often excites ſuch a diarrhæa as almoſt exhauſts the body, and reduces a fat perſon to a ſtate of leanneſs in a few days time, almoſt all the fat being diſſolved and expelled by ſtool. Honey, ſugar, ſyrups, and inſpiſſated juices prepared from ſuch garden fruits are alſo moſt efficacious remedies in this caſe. I ſaid before upon another occaſion (ſee § 376.) that unwarily taſting the berries of Mezerean, which deceived my palate with a mild flavour, they left ſo great a burning in my fauces as made me afraid of ſuffocation; and it was in vain that I attempted to waſh out that acrimony which reſided in the oil; nor could I remove this troubleſome acrimony by any thing but a mixture of vinegar and water with honey. A decoction of oats with ſimple oxymel, or with the inſpiſſated juice of elderberries, currants, ſyrup of citron juice, *&c.* afford the moſt pleaſant, and at the ſame time the beſt remedies. For in theſe there is a diluent water combined with a ſaponaceous deterging force and a pleaſant acid; and at the ſame time the ſoft gluey ſubſtance of the oats ſerves to ſheathe all acrimony.

By ſheathing or mitigating with ſoft gelatinous ſubſtances.] Which are either procured from animals or vegetables: the firſt ſpontaneouſly incline to an alcaline nature, and the latter rather incline to an oppoſite diſpoſition. When therefore a putrefaction of the humours is feared from too great motion, or the known temperature of the patient, we are to abſtain from the uſe of jelly of hartshorn, ivory and the like, or at leaſt we ought to add to them the juice of citrons, lemons, or the like, which may correct their inſipid taſte, and at the ſame time well reſiſt putrefaction. Decoctions made of barley, oats, and the like, are uſeful by their ſoft mealy glue, and are ſpontaneouſly inclined to acidity, which is here the beſt. Linſeeds, the ſeeds of quinces, fleabane, *&c.* afford a ſoft glue or mucilage, which yet is tenacious and viſcid enough to obſtruct and load the ſtomach and firſt paſſages, if it is taken in too great a quantity. But a prudent uſe of theſe ſubſtances effectually infringes all acrimony, and very well arms the fauces, œſophagus and ſtomach, when they are almoſt excoriated by the ſharpeſt ſpices.

Alcaleſcent acrids, *&c.*] Radiſhes, creſſes, garlic, leeks, onions, *&c.* have a great acrimony, and at the ſame time incline to an alcaline nature, and many of them too contain a true volatile alcaline and oily ſalt. But for all theſe, diluting with watery drinks and correcting with acids, are equally uſeful with ſuch things as ſheath or obtund. But the ſaponaceous reſolving medicines before recommended are not here ſo uſeful, becauſe theſe acrids are not enveloped in ſuch a tenacious oil, while the blood and all the humours are already too much diſſolved by exceſs of the like alcaleſcent foods; for they who indulge themſelves too much in theſe are often obſerved to be ſeized with profuſe hæmorrhages. Therefore in this caſe auſtere acids are of the greateſt uſe, as the foſſil acid ſpirits of ſea-ſalt, nitre, ſulphur and vitriol; as alſo vegetable acids, which by ſtrengthening the ſolids and compacting the fluids, are able to correct the pernicious effects of alcaleſcent acrids, ſuch as unripe medlars, ſumach-berries, roots of tormentil, biſtort, *&c.*

9. That irritation which ariſes from alcaleſcent foods of the parts of animals, is to

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be remedied by the means before deſcribed (§ 76, to 91.)

When we treated of diſeaſes ariſing from a ſpontaneous alcali in the place here cited, it appeared that our body is of ſuch a nature, that it is able to prepare ſuch humours by the force of the veſſels and viſcera, with the commixture of the other animal humours, that although they proceeded from foods either inclined to acidity or already acid, yet the humours thus made never ſpontaneouſly turn acid, but incline to putrefaction. If therefore ſuch nouriſhment is taken into the body as hath already this property, namely, which inclines to putrefaction, it is ſufficiently evident that the ſpontaneous alteration of the ingeſted aliments conſpiring together with the change to be introduced in them by the powers of the body, may give reaſon to fear a putrefaction, with all the maladies that may thence follow, unleſs acids or ſalts are taken in together with them, which powerfully reſiſt all putrefaction. Hence no one can long ſupport a diet prepared only of rapacious animals living upon other animals, and more eſpecially if the fleſh of ſuch animals is prepared by baking, frying, or roaſting. But what maladies may follow from ſuch a diet, and what methods of cure are then required, we have already declared under the head of a ſpontaneous alcali.

10. That which ariſes from aliments offending in quantity, by conſtringing the mouths of the ſtomach, is remedied by diluting, faſting, vomiting and purging.

For the ſtomach to make a due digeſtion of the food, it is not to be filled beyond its proper ſtrength, as we ſaid more at large in the comment to § 586. N°. 1.

N°. 1. For that the quantity of the food only may be offenſive, however ſalutary it may be in itſelf, we are taught by ravenous children, who frequently have fevers of the worſt kind from this cauſe, until the load of offending matter is diſcharged from the ſtomach. For the food being taken in too large a quantity into the ſtomach, does not receive the change which is neceſſary that it might be further elaborated and perfected in the inteſtines, but it follows its ſpontaneous inclination, which tends either to an acid, putrid or rancid ſtate. The whole cure therefore in this caſe will conſiſt in diſcharging the offending quantity of aliment in the ſtomach; or if this cannot be ſafely performed, to allow ſome time for faſting, that the ſtomach may by degees be capable of digeſting what it contains, at the ſame time diluting the food contained, ſo that it may more eaſily paſs out through the pylorus. For it is well known from phyſiology that the thinneſt part of the ingeſted aliments paſſes out firſt through the pylorus, but that the more groſs are longer retained, 'till they are better adapted to make their eſcape by a farther diſſolution from the humours and liquors taken into the ſtomach. But the diſorder is much the more dangerous when the exceſs in quantity of food over-diſtends the ſtomach ſo much, that both its orifices are contracted with a convulſive force or ſpaſm, while in the mean time the air ſwallowed together with the food, rarefies by the warmth of the parts, and the aliments themſelves entering upon an inteſtine motion of fermentation or putrefaction are expanded into a greater bulk; for thus the ſevere anguiſh ariſing from the turgeſcence of the ſtomach is increaſed every moment, the adjacent viſcera are compreſſed, and the veſſels diſperſed through the ſubſtance of the ſtomach itſelf

ſelf are ſtraitened, whence an inflammation and even a gangrene itſelf of the ſtomach and viſcera may ariſe from ſuch a ſuffocation. In the mean time the deſcending trunk of the aorta, and the adjacent viſcera, being compreſſed by the diſtended ſtomach, the blood is ſent more difficultly through them; and therefore it is urged with a greater force towards the head, whence a redneſs of the face, watering of the eyes, head-ach, giddineſs, and ſometimes a fatal apoplexy may with reaſon be feared. But that an over-diſtenſion of the ſtomach will ſo cloſe up its orifices that nothing can paſs out, appears from many obſervations. When great drinkers at a feaſt take down large draughts at once, each orifice of the ſtomach is then conſtringed with a ſpaſm or cramp from the coldneſs or quantity of the wine, and ſoon after follows intolerable anxiety; and even though they preſs the abdomen with their hands, nothing can be forced out of the ſtomach to give them any eaſe. How doubtful and dangerous the caſe then is, readily appears; for if you attempt to unload the ſtomach by vomit, in the act thereof the diſtended ſtomach is violently compreſſed betwixt the abdominal muſcles and diaphragm as in a preſs, and if at the ſame time the upper orifice is not relaxed, the ſtomach may burſt; or elſe the blood being violently drove towards the head in the endeavour to vomit, there may be danger of a fatal apoplexy from a rupture in the veſſels of the encephalon. It is therefore more adviſeable firſt to empty the veſſels by plentiful bleeding, and then to excite vomiting by irritating the fauces with a feather. Then alſo ſuch vomits will be ſerviceable as act immediately without any delay, as the vitriolum album diluted with water, which excites a vomiting almoſt as ſoon as it is ſwallowed, for here delay is dangerous. But when the ſtomach is overcharged with too great a quantity of food, and yet is not ſo diſtended as to cauſe a cloſe contraction of both the orifices, then there is opportunity for diluting, and only warm water of itſelf is almoſt ſufficient for the intention, becauſe it at the ſame time uſually excites a ſickneſs and inclination to vomit, more eſpecially if it was ſweetened with honey. But if no vomit follows after diluting, nor any relief to the anguiſh, it denotes that the contents of the ſtomach are partly eſcaped through the pylorus: other vomits may then take place, which uſually operate in ſome time after they are given, of which there are ſeveral forms given in the *Materia Medica* correſponding to this number of the preſent aphoriſm; and it will be alſo uſeful to give a purge afterwards, that the crude matter which has paſſed from the ſtomach into the inteſtines may be expelled out of the body, and not be offenſive for the future. For every thing which has not been changed by the action of the ſtomach, will be more difficult to digeſt into good chyle, when it comes into the inteſtines.

But how dangerous it is to excite violent vomiting when the ſtomach is full, is ſufficiently evident from the unhappy caſe of the late moſt noble Lord High Admiral of our Republic (ſee the comment to § 170. N°. 5.) who by the ſtrongeſt endeavours broke off the tube of the œſophagus of the ſtomach near the diaphragm, from whence he unhappily periſhed after the moſt intolerable tortures.

But when the ſtomach has been a long time diſtended with too great a quantity of food, it often loſes its ſtrength, and remains as it were paralytic for ſome time after it has been emptied of its contents; and this for the reaſons before given in the comment to § 25. N°. 3. nor are the muſcular fibres conſtituting the ſubſtance of the ſtomach alone weakened, but its orifices are alſo relaxed; ſo that the ingeſted aliments are lodged as it were in a loſe ſack, exerting no action upon them, and in a little time they paſs by the motion of reſpiration through the pylorus into the inteſtines, having ſuffered little or no change in the ſtomach. The ſame thing we ſee happens when the bladder becomes paralytic after retaining the urine a long time, and when it has been drawn out by the catheter; for then a moſt troubleſome incontinency or dripping of the urine often continues for a long time, while the ſphincter of the bladder being alſo relaxed, is not capable of contracting the neck. In this caſe the beſt remedy is to take food and drink in ſmall quantities at a time, to avoid all diſtenſion of the ſtomach; for thus the too much diſtracted fibres gradually recover their former ſtrength (ſee the comment to § 28. N° 5.).

11. That which ariſes from acrid fermented drinks, or from a fermenting acid, oily, or aromatic ſtimulus introduced by diſtillation, or ſpontaneouſly; ſuch acrimony is removed by the remedies before mentioned (N° 5, 6, 8, of this aphoriſm).

That the worſt fevers may ariſe ftom hence, we have already ſeen in the comment to § 586. N°. 1. for by fermentation we know there is a wonderful kind of new ſtimulus formed even in ſuch things as before had no apparent acrimony. Thus the juice of grapes, which is ſo mild and ſweet at its firſt expreſſion, is by fermentation only changed into a very fragrant wine; and from the very ſoft meal of barley by fermentation may be made the ſtrongeſt alcohol. But during the time while theſe are fermenting, a moſt fragrant vapour is diſcharged, which is wonderfully refreſhing if drawn ſparingly thro' the noſtrils; but at the ſame time it is a moſt certain poiſon, if it is imprudently breathed in too copiouſly, eſpecially if the vapour from the caſk of fermenting wine comes thro' only a ſmall vent-hole. From this cauſe we read of a fatal apoplexy [z] ariſing in a man, who went into a cellar wherein was collected a large quantity of this wild ſpirit, which in the height of the fermentation had flown off with great violence from the fermenting liquors. But although there may be ſomething of this ſpirit remaining in alcohol made from fermented liquors, yet it ſeems to be diſtinct from the alcohol itſelf. Helmont calls this ſpirit *Gas* [a]; and confeſſes; *Se olim authoritate ſcriptorum deluſum credidiſſe, Gas uvarum eſſe ſpiritum vini in muſto: ſed caſſa tentamina docuerunt, eſſe Gas uvarum & muſti, in via ad vinum, non autem vini ſpiritum.* "That being deluded by the "authority of writers, he believed that the gas "of grapes was the ſpirit of wine in the muſt; "but unſuccefsful experiments have taught us "that the gas of grapes and wine is a ſort of in- "termediate agent in the way of its being form- "ed into wine, and not ſpirit of wine itſelf." But ſince fermentation is performed in the open air, it would ſeem that this volatile ſpirit ariſing in fermented liquors muſt exhale for the moſt part; but perhaps alſo ſome part of it is retained by, and fixed in the reſt of the fermented liquor. Certain it is, that if the pureſt tartar be diſtilled in cloſe veſſels, ſomething eſcapes from it ſo volatile that it cannot be confined in any veſſels; and if the veſſels are ſo cloſe as not to afford it any vent, however large the receiver may be, it will make itſelf a way through by cauſing the receiver to fly. Hence it appears how dangerous it muſt be to drink liquors which have had their fermentation ſuppreſſed in the act itſelf; for from thence the moſt violent cholera morbus and other dreadful maladies have often followed. Perhaps in new and briſk wines ſome of this ſpirit being confined, affords that which is ſo highly reſtorative to old age, and from whence Cornaro found his languiſhing powers in the laſt of his old age immediately recruited, when they could not be raiſed by any other remedy, as we ſaid before upon another occaſion in the comment to § 55.

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[z] Herm. Boerh. Chem. Tom. I. pag. 806. Tom. II. pag. 180. Miſ. curioſ. decur. 3. ann. 2. pag. 56.

[a] In Capitulo: Complexionum atque miſtionum elementalium figmentum N°. 18. pag. 87.

But after the fermentation is over and the fæces depoſited to the bottom, the limpid liquor ſwimming above is called wine, which though prepared of very different materials, and differing in the ſmell, taſte, and other properties, yet it has this in common, that being drank in a large quantity it inebriates or fuddles, and gives by diſtillation an ardent ſpirit miſcible with water; for whether the liquor be prepared from the juice of grapes, honey, barley, or any other fermentable ſubſtance, always the ſame ſpirit is obtained.

When any fermented liquor, wine, mead, ſtrong ale, or the like, is drank by a perſon not much accuſtomed to it, it induces a greater heat throughout the body with chearfulneſs of mind; all the ſenſes become more ready and the members more active, all the paſſions of the mind are moſt quiet or agreeable, devouring cares are mollified,

fied, and the reaſon becomes moſt correct; and even a perſon who has been exhauſted by meditation finds very great refreſhment by a moderate uſe of wine; therefore under a juſt moderation fermented liquors may be put to the beſt uſes. But if they are taken in a larger quantity, all the ſenſes both internal and external, with the voluntary motions, are diſturbed and weakened, inſomuch that neither the hand, foot, tongue, nor even the mind can any longer perform their office; and at length from exceſs in the uſe of them, every thing proceeding from the mind is aboliſhed, inſomuch that people fall into a moſt deep ſleep or ſtupidity, or even ſometimes into a moſt fatal apoplexy, as we are aſſured from medical obſervations.

But inflammable ſpirits made from ſuch fermented liquors produce all theſe effects much ſooner; but then they likewiſe diſappear ſooner, as they are in a little time again exhaled from the body. Therefore the inebriating force in theſe liquors ſeems to proceed from the inflammable ſpirit which they contain; for if that be removed by diſtillation, or exhaled by neglecting to keep the liquor cloſe, what remains is vapid and inert, having loſt all its inebriating force.

But worſe conſequences ariſe from the drinking inflammable ſpirits than fermented liquors, becauſe in the former there is obſerved a force of coagulating the blood and lymph, and of hardening the ſolid parts; and the more ſo, as being diluted with a leſs quantity of water, they approach nearer to the nature of alcohol. Hence thoſe unhappy patients who have too much indulged themſelves in theſe liquors, are frequently troubled with the moſt obſtinate obſtructions, and even ſometimes their viſcera are found perfectly ſcirrhous after death, as was ſaid before upon another occaſion in the comment to

§ 28.

§ 28. But the worſt of all is when ſharp ſpices are added to theſe burning ſpirits, eſpecially ſuch as afford a great quantity of oil; for then the ſtrong aromatic force increaſes all theſe maladies, and may be able to excite the moſt ardent fevers. Thus for example, a greater or more laſting drunkenneſs ariſes from aniſeed water or ſpirit, than from vinous ſpirit only drank in the ſame quantity.

But the cure of ſuch maladies as follow from the uſe of fermented liquors is various. For one method is required during the time of the drunken fit, and another method of cure is required in the crapulary fever which follows after. Again, a different method of cure will be proper for thoſe who ſeldom indulge themſelves thus; and in thoſe [b], *Tanquam ad perdenda vina geniti, & tanquam effundi illa non poſſint, niſi per humanum corpus.* "Who being formed as it were for the deſtruction "of wines, cannot pour them out but through "the body," having their veins always filled with the wine of the day before; for there is a great deal of difference betwixt the curing of a perſon drunk, and one who is addicted to that practice. Moreover, a different method of cure will be required according to the different acrimony of fermented liquor, as it is either acrid, oily, aromatic, &c.

When therefore a fever is kindled from having taken too great a quantity of fermented liquors, the beſt method of all is to dilute with a great quantity of water or watery liquors of any kind, for thus the diſorder will be allayed in a ſhort time. For the ſtrongeſt wines (as was ſaid in the ſecond number of this aphoriſm) being diluted with much water, may be ſafely given even to febrile patients; and even alcohol itſelf diluted with a large quantity of water may be ſafely drank." * *Ingenioſiſſimus ſui ſæculi medicus Caſſius, febricitanti cuidam & magna ſiti affecto, cum poſt ebrietatem illum premi cæpiſſe cognoſceret, aquam frigidam ingeſſit. Qua ille epota, cum vini vim miſcendo fregiſſet, protinus febrem ſomno & ſudore diſcuſſit.* "The moſt ingenious phyſician of his age Caſſius, gave cold "water to one ill of a fever attended with great "thirſt, when he had learnt that the patient be- "gan to be taken with it after a fit of drunken- "neſs, and which water being drank by the pati- "ent, deſtroyed the force of the wine by mixing "with it, and immediately carried off the fever by "ſleep and ſweating." But it is better to give ſuch watery drinks tepid, leſt by the ſudden cold of them they ſhould injure the heated body. Theſe are alſo ſerviceable, becauſe they often occaſion a great part of the fermented liquor to be thrown up by vomit. This being done, quiet ſleep is the beſt remedy, that by this means the fibres may reſt. The like method has been recommended by Hippocrates; for if a perſon has loſt his ſpeech from a drunken fit, he then orders the patient, *Multa calida lavari, & ſpongias calida imbutas ad caput admoveri, donec ad ſe redeat; deinde copioſo oleo illitum, in mollibus ſtratis, veſtimentis tectum recumbere; neque apud eum lucernam ardere, neque loqui. A balneo enim ut plurimum dormit; & ſi dormierit, ſanus evadit*[c]; "To be waſhed with much warm water, and "ſponges dipped in warm water to be applied to "the head 'till the patient comes to himſelf; "and then after plentifully anointing with oil to "let him lie in his cloaths lightly covered over, "and not to ſpeak to him, nor burn any light near "him. For after bathing, ſleep generally follows, "and

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[b] Plinii Natur. Hiſt. Lib. XV. cap. 22. pag. 355.

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* Celſus in Præfatione pag. 18.

[c] Hippocrat. de Morbis Lib. I. cap. 7. Charter. Tom. VII. p. 559.

" and if the patient ſleeps he recovers his health " and ſenſes." Yet watchfulneſs and a crapulary fever as it is called, will remain the ſame day as a puniſhment, together with a wearineſs of the whole body, pain in the head, ſickneſs in the ſtomach, and often a giddineſs. In this caſe a gentle vomit is uſually of ſervice to diſcharge the humours loading the ſtomach, and this being done nothing can be more uſeful than ſtrong wine in moderation, by the grateful ſtimulus of which the languiſhing powers of the body may be raiſed. Even Hippocrates [d] ſays; *Si ex crapula caput doleat, vini meraci heminam bibat.* " That if the head " aches from a crapula, let the patient drink three " gills of ſtrong wine." Hence thoſe who contend daily with Bacchus having once experienced this, often indulge themſelves the next morning with fermented ſpirits, till at laſt by a repeated abuſe of them they unhappily deſtroy the body. But when the fermented liquor drank is alſo impregnated either with an acid, oily or aromatic acrimony, then it will be alſo neceſſary to have recourſe to the medicines enumerated at the ſixth and eighth number of the preſent aphoriſm.

But miſerable is the condition of thoſe who daily indulge themſelves in theſe liquors, for a fatal neceſſity then follows of repeating them; and at length almoſt the whole ſyſtem of their vital and animal actions depends upon a repetition of their drinking, *Pallor enim, genæ pendulæ, & tremulæ manus effundentes plena vaſa* [e]. " For paleneſs and " ſinking in, or looſeneſs of their cheeks, with " trembling hands beſet with large blood-veſſels," oblige them to drink again even without invitation

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[d] Epidem. Lib. II. in fine. Charter. Tom. IX. p. 192.
[e] Plinii Natur. Hiſt. Lib. XV. cap. 22. pag. 355.

I have with great pity ſeen a young man, who being about to get out of bed in a morning trembled, and had very troubleſome palpitations of the heart, being hardly able to move any limb, much leſs put on his cloaths, until he had taken a few ounces of brandy. If this unhappy perſon attempted at any time from great neceſſity to oppoſe this cuſtom, he fell into faintings, and was obliged to uſe it even againſt his will. Thus at length his limbs being contracted with great drineſs he miſerably periſhed in the flower of his age, after leading a moſt calamitous life.

Drunken people therefore are never able to abſtain from theſe liquors altogether at once, nor would it be ſafe for them if they could. For if the advice of Hippocrates †, that ſudden changes are bad, ought to be obſerved in any caſe, it ſhould in this; for as the ſame great man obſerves, thoſe alterations only are ſafe which are made by degrees, more eſpecially if a perſon leaves one cuſtom to take to another of an oppoſite kind. For by taking large quantities of fermented liquors or inflammable ſpirits thence diſtilled, the body is heated, the humours rarified, and the veſſels are ſwelled by their diſtenſion with the rarefied humours; but ſo ſoon as the force of theſe liquors has vaniſhed, the body is left weak, cold and enervated, until this languor is removed by the ſame kind of ſtimuli. They are alſo uſually tormented with ſevere thirſt afterwards, and thus by much drinking they increaſe the weakneſs which is once formed. But when drunkards daily indulge themſelves in theſe liquors, the veſſels which are ſo often dilated become weak, and loſe their tone or contractile force, giving way too eaſily

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† Aphor. 50, & 51. Sect. II. Charter. Tom. IX. pag. 88, 89.

eaſily to the diſtending humours. Hence follows a leſs action of the veſſels upon the humours, and ſo a leſs perfect aſſimilation of the ingeſted aliments muſt conſequently enſue; whence an ill habit both of the ſolids and fluids, and at length a fatal dropſy is uſually the reſult in ſuch people: All which bad accidents are likewiſe haſtened, if they are obliged to abſtain from theſe drinks altogether at once. The beſt method of cure therefore will be to leſſen by degrees the abuſe of wine, or ſpirits drawn from fermented liquors; as inſtead of naked inflammable ſpirits, ſtrong and rich wine may be drank in moderation, which may ſupport the languiſhing powers and relieve the weakneſs of the ſtomach, while at the ſame time it is not attended with thoſe ill conſequences which are juſtly feared from ardent ſpirits, namely, a coagulation of the humours, and a too great hardneſs of the ſolid parts. In the mean time the diet ſhould be dry, of bread well fermented, or which has been baked twice, the roaſted fleſh of young animals, boiled river fiſh, and ſtrong ale for the common drink, avoiding warm watery liquors which weaken, and at the ſame time increaſing by degrees the exerciſe of body; whereby the veſſels and viſcera may be ſtrengthened. If the ſigns teach that the blood inclines to an inflammatory tenacity, acid ſaponaceous juices, ſuch as the rob of elderberries, currants, oxymel, and the like, will be of ſervice. But if theſe drinkers are in years and inclined to be dropſical, the Theriaca Andromachi, Diateſſaron, candied ginger, and the like warm aromatic medicines will be of the greateſt uſe, as they excite an agreeable warmth in the ſtomach, diſpoſe it for the better performance of its office, and recruit the loſt or weakened powers of the body, ſo as to enable it to refrain from fermented liquors without damage. This method has its effect in caſes almoſt deplorable, nor does it ever deceive the expectation, unleſs when the viſcera have acquired a ſchirrous diſpoſition, or when the tender pulp of the encephalon and nerves being almoſt deſtroyed, has rendered theſe diſorders already incurable.

12. That irritation which ariſes from too much watchfulneſs or want of ſleep, is cured by the ſame means with thoſe before propoſed N°. 1,2,5. of this aphoriſm.

So long as we are awake the organs of ſenſe are affected by objects, and the muſcular motions are performed; for a healthy perſon being perfectly at reſt in body, and not affected by any external object, ſoon falls into a ſleep. But to diſpoſe the ſenſes to be affected by objects, and for the motions of the muſcles to be performed, requires the preſence of good ſpirits plentifully ſupplied in the brain, its medulla, nerves, and in the muſcles *. To be long watchful therefore conſumes the ſpirits, diſſipates the moſt ſubtle humours and dries up the reſt, breeds melancholy or atra bilis in the body, ſettles in the hypochondria, and diſturbs the functions of the brain: Hence follows delirium, ravings, madneſs, *&c.* But all the actions of the chylificative viſcera are alſo made languid from the ſame cauſe, whence a cachexy, cacochymy, and the other numerous maladies which thence proceed. For the ſubtle ſpirits which are conſumed by vigilance can be repaired by no art but by ſleep; for whoever watches all night, and has not been accuſtomed to interrupt their ſleep, will

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* H. Boerh. Inſtit. § 588.

will find all their limbs heavy the next day, the whole body weak, and almoſt every one of its functions diſturbed; nor will theſe complaints ceaſe 'till the languiſhing members are refreſhed by ſleep. Hence Hippocrates [f] obſerves, *Vehemens vigilia potus & cibos, tum crudos, tum incoctiores efficit.* "That vehement watchings occaſion the food and drink to be both crude and indigeſted;" and in another place [g], *Peſſimum autem eſt non dormire, neque die, vel enim præ dolore aut afflictione vigilarit, aut delirabit ab hoc ſigno.* "But it is a very bad ſign not to ſleep either in the night, or in the day, for either the patient will become vigil through pain or affliction, or elſe will be delirious from this ſign." In thoſe who thro' the ſeverity of their ſtudies break thro' their reſt in the nights, there are many ſad inſtances demonſtrating the pernicious effects of over watching; for either they fall into fevers of the worſt kind, always accompanied with a delirium, or elſe they are taken with an obſtinate madneſs.

The cure therefore of fevers ariſing from over watchings requires ſleep in the patient, to correct thoſe changes which happen to the body from too much vigilance. The firſt is performed, if all violent paſſions of the mind, which are frequently the cauſe of over watchfulneſs, are allayed by ſuch remedies as thoſe concerning which we treated at the fifth number of the preſent aphoriſm. At the ſame time the moſt profound reſt and ſilence ſhould be procured to the body by removing every thing capable of violently affecting the ſenſes; and therefore ſuch patients ſhould be retained in a very dark place, the moſt remote from all noiſe, De-

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[f] De Victu acutor. Charter. Tom. XI. pag. 76. [g] Coac. prænot. N°. 497. Charter. Tom. VIII. pag. 881. & in Prognoſticis ibid. pag. 625.

Decoctions of the ſofteſt mealy ſubſtances, emulſions prepared from the ſame are likewiſe of the greateſt uſe, adding at the ſame time the prudent uſe of anodynes, if ſleep cannot be procured by the former remedies. But ſince by over watching, as well as by too much heat and motion of the air, the moſt fluid parts of the humours are diſſipated, therefore moiſtening, diluent and nitrous medicines with honey, *&c.* will be ſerviceable, concerning which we treated at the firſt and ſecond number of the preſent aphoriſm.

13. If the irritation proceeds from excrements retained in the body, from an alcaline, acid, oily, ſaponaceous or putrid acrimony, that acrimony is to be rendered fluid, the paſſages are to be lubricated, the emunctories opened; the expulſive powers are to be ſtimulated and increaſed, and all this is to be performed as well by external as internal remedies.

Thoſe particles being retained in the body which uſed to be diſcharged, excite fevers, as we have already ſeen (§ 586. N°. 2.) For by thoſe actions which are required to life and health, ſome parts of the ſolids and fluids are ſo altered that they become unfit for thoſe uſes which they ought to ſerve agreeable to the laws of health; hence theſe parts ought to be expelled from the body, leſt being retained too long they ſhould acquire too great acrimony, and by that means injure health. Theſe evacuations are commonly made by three capital emunctories, namely by ſtool, urine and perſpiration. By ſtool thoſe parts of the ingeſted aliments are evacuated, which remain indigeſted after having ſuffered the action of the ſtomach and inteſtines, accompanied with thoſe fæces which have been left behind from the humours themſelves flowing or diſtilling into the cavity of the ſtomach and inteſtines. By urine the oily and ſaline parts of the blood which are become too acrid are waſhed out. By perſpiration alſo ſome parts are exhaled (together with a moſt thin water ſerving to moiſten, and preſerve the ſmalleſt veſſels opening on the ſurface of the body) which being retained would be injurious, as we have often ſaid before. The menſtrual flux in women diſcharges what is ſuperfluous, and by the lochial diſcharges of lying-in women that blood is expelled which lay in the dilated veſſels of the uterus, and which being expoſed to the air is very ſoon corrupted. But ſometimes in fevers themſelves the morbific matter is ſubdued and rendered moveable by the fever, yet retains ſuch qualities as oppoſe the equable circulation, which makes an expulſion of it in this caſe neceſſary (ſee § 594. N° 2.)

But all theſe parts being left in the body cannot be aſſimilated into healthy humours, whence they ſpontaneouſly degenerate by the heat of the body itſelf, and variouſly change, according to the different nature of things which are thus retained in the body. For in infants and weak people the fæces being too long retained in the inteſtines puts on an acrimony of the worſt kind, more eſpecially if they feed upon ſuch aliments as ſpontaneouſly incline to acidity. But the other kinds of retained excrements rather incline to a putrid alcaline acrimony, or elſe to a rancid malignant corruption, when there are a great many oily or fat particles, or elſe likewiſe into ſaponaceous putrefaction, as generally happens, when the ſalts being rendered more acrid are united together with the oils. Thus there is obſerved a very bad putrefaction of the ſaponaceous bile in diſeaſes, and ſalts and oils being intimately united together in the urine, form as it were a ſaponaceous lixivium frothing when it is ſhook, but often in ſome meaſure putrid in acute diſeaſes. How fœtid the lochia are often diſcharged, when they have been too long retained in lying-in women, is teſtified by daily obſervation; whence alſo the moſt putrid and ſuddenly fatal fevers often ariſe from the ſuppreſſion of them.

Yet are not all excrements long retained equally pernicious. An entire ſuppreſſion of the urine is indeed the worſt, yet it is tolerable for ſeveral days, though it is never without danger. An obſtructed perſpiration is commonly followed immediately with a heavineſs and wearineſs, *&c.* and if it continues any conſiderable time it commonly occaſions a fever. A ſuppreſſion of the inteſtinal fæces may be longeſt of all ſupported, and often without any great damage; and it is even cuſtomary with many ſtrong and even healthy men, only to diſcharge their fæces once within three or four days. But in theſe the fæces are collected together near the rectum; and that part which might have offended by its putrefaction is commonly expelled by wind, while the reſt are dried up and formed into the moſt hard fæces. Hence in diſeaſes there is no ſuch very urgent indication ariſing from a conſtipation of the bowels, unleſs there are ſigns denoting that corrupt humours ſtagnate in the firſt paſſages. At leaſt in healthy people we are not immediately to have recourſe to purges, upon finding the bowels more than uſually conſtipated. Hippocrates [h] indeed ſays; *In omnibus morbis ventres ſubluendos eſſe, aut glandes ſupponendas, ſi alvus non ſubducatur.* "That in all diſeaſes the

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[h] De Morbis Lib. II. cap. 21. Charter. Tom. VII. p. 573.

"bowels are to be cleanſed by clyſters, and if they "are not mindful of their office ſuppoſitories muſt be uſed." But theſe act only by diluting the fæces and relaxing the inteſtines, or elſe by irritating the end of the rectum, they excite a teneſmus or inclination to empty the bowels, and therefore they may be very ſafely uſed. But the fault of many lies in this, that in ſuch caſes they have immediately recourſe to purges, whereby the body is often diſturbed, and thoſe evacuations ſuppreſſed by which nature endeavoured to cure the diſeaſe. Thus Sydenham [i] obſerves, that in the cure of a continual fever which he deſcribes, it always fared ſo much the better with the patient as the bowels were more conſtipated in the decline of the diſeaſe after ſuitable evacuations had been premiſed.

When therefore any of the excrements being retained in the body have excited diſeaſe, they muſt be expelled. But that this may be performed, the matter to be diſcharged muſt be rendered fluid, that it may be able to paſs through the paſſages whereby it ought to eſcape from the body. The paſſages themſelves are therefore to be lubricated, that they may eaſily tranſmit what is to be expelled. If any of the emunctories are obſtructed, they are to be firſt opened; and laſtly, when all this is performed it is required to ſtimulate and increaſe thoſe powers by which the excrements are naturally expelled, that after being collected together by a long retention, they may be thrown out of the body by the increaſe of theſe powers. This thing will appear more evident by example: Some lean people of a tenſe fibre have ſuch ſtrong chylificative viſcera, that they draw off every thing that is ſoluble from the ingeſted aliments, and therefore leave the fæces accumulated, dry and juiceleſs, in the large inteſtines; and as in ſuch dry habits there is found a leſs quantity of that lubricating mucus lining the large inteſtines, eſpecially towards the extremity of them, therefore the excluſion of the dry fæces is rendered more difficult; hence ſuch people are commonly coſtive, and frequently to a very great degree. The beſt remedy then in the power of art is to divide the too groſs fæces by a plentiful uſe of ſaponaceous medicines with honey by the very emollient decoctions of marſh-mallows, common mallows, linſeed, *&c.* to moiſten and dilute the too dry parts; to anoint and lubricate the ſides of the inteſtines by drinking of oil, or by the injection of clyſters; or laſtly, by fomenting the anus with warm baths or fomentations, that the parts being relaxed may give way more eaſily. But when all theſe means have been tried, then and not before it will be convenient to ſtimulate and increaſe the expulſive powers, whether it be attempted either by giving a purge, a ſharp clyſter, or laſtly, by exciting a teneſmus to diſcharge the fæces by intruding a ſuppoſitory into the anus. But if the expulſive forces are ſtimulated before the fæces are rendered fluid, the paſſages lubricated, and the emunctories opened, all the diſorders will be increaſed, and the hard fæces being put into motion may excoriate and inflame the ſides of the inteſtines, whence frequently enſue the very worſt diſeaſes. Hence Hippocrates [k] juſtly pronounces; *Corpora, ſi quis purgare voluerit, meabilia* (εὔροα) *facere oportet.* "That if any one intends to purge or cleanſe the body, he ought "firſt to render the excrements pervious." But from this example it is evident enough that the like methods muſt be proſecuted in a ſuppreſſion of the other natural excrements.

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[i] Sect. I. Cap. 4. pag. 70.

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[k] Aphor. 9. Sect. II. Charter. Tom. IX. pag. 49.

The ſame precaution muſt be likewiſe obſerved when the evacuation of morbid excrements is to be promoted: For it is firſt required to ſubdue the morbific matter, and render it moveable by the force of the fever itſelf, before any expulſion of it is deſigned. Hence again Hippocrates [l] gives us an admonition; *Concocta purganda ſunt & movenda, non cruda, neque in initiis, niſi turgeant, plerumque autem non turgent.* "That ſuch morbid humours are to be purged off and put into motion as are concocted, and not ſuch as are crude; nor are we to work theſe effects in the beginning of diſeaſes unleſs they overpower nature by their violence, which they generally do not." What miſchiefs follow when phyſicians neglect this rule in the cure of diſeaſes, has been taught by Sydenham in ſeveral parts of his works; for many obſerving, that after continued fevers had gone regularly through their courſe, they often went off with a mild diaphoreſis, therefore they endeavour to force ſweats in the beginning of the diſeaſe; but this is commonly attended with fatal events, inaſmuch as the fever being increaſed by heating medicines brings on a phrenzy, peripneumony, and the like moſt grievous maladies. But when the wiſe phyſician obſerved that the force of the diſeaſe languiſhed on the twelfth day of an acute continual fever, the morbific matter being in the mean time concocted, and nature endeavouring to make a ſeparation, then he would have the warmer medicines to be more freely uſed; and by this means the matter to be diſcharged being firſt rendered fluxile, he ſtimulated the expulſive powers, and with very good ſucceſs[m]. But as nature is uſed to endeavour to expel the concocted and morbific matter by various ways (ſee § 594. N°. 2.) therefore one ought carefully to diſtinguiſh which way nature inclines; and when we have diſcovered thoſe ways, we are to apply remedies of this kind both external and internal accordingly; for as Hippocrates ſays, *Quæ ducere oportet, ducenda ſunt, quo maximè vergat natura, per loca conferentia.* " What " ought to be evacuated muſt be drawn off by " thoſe ways which are moſt inclined to by nature, " and by the moſt agreeable paſſages[a]."

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[l] Aphor. 22. Sect. I. Charter. Tom. IX. pag. 38.

[m] Sydenham Sect. I. cap. 4. pag. 71.

## SECT. DCVI.

THE emunctories are ſet open by reſolving the impacted matter, and by relaxing the obſtructed veſſels; which are obtained by warm bathing, fomenting, frictions, ſhaving of the hair, and cleanſing the ſkin (ſee § 107, to 144).

If the retention of the excrement to be expelled proceeds from an obſtruction of the emunctory, it is very evident that this muſt be firſt opened: but this obſtruction of the emunctory proceeds either from an imperviouſneſs of the matter heſitating in the outlet, or by a compreſſure from the adjacent obſtructed and diſtended veſſels. In either caſe the impacted matter is to be reſolved, or the obſtructed veſſel ſo relaxed that it may give way more eaſily to the force of the humours urging behind, and by that means dilating, tranſmit what adhered immoveable. For as we ſaid in the aphoriſm cited in the text (which contained the whole hiſtory and cure of obſtruction) the veſſels are obſtructed through a defect of the particles to be tranſmitted exceeding the capacity of the tranſmitting veſſel; and therefore muſt follow either from a narrowneſs of the veſſel, the bulk of the particles to be tranſmitted, or of both together. The effect will therefore be the ſame, namely, a reſolution of the obſtruction, whether the capacity of the veſſel be increaſed, or the bulk of the particles to be tranſmitted, leſſened, and more eſpecially will the cure be ſooner obtained, if both theſe effects are accompliſhed at once. But here a different method of cure is evidently required according to the different cauſes of obſtruction, and the more or leſs obſtinate coheſion of the impacted matter, concerning which we treated under the head of obſtruction. But this intention may be more eſpecially anſwered in theſe caſes,

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[a] Hippocr. Aphor. 21. Sect. I. Charter. Tom. IX. pag. 38.

By warm bathing and fomenting.] How uſeful theſe means are to relax parts too rigid has been ſaid in the comment to § 35. N°. 3. and at § 127. N°. 2. But theſe alſo at the ſame time apply a diluent vehicle to the parts to diſſolve the impacted obſtructing matter. But of all things the vaporous bath has the moſt happy effects, ſince the vapour of warm water much more powerfully relaxes every thing than the hot water itſelf. This is evident from the moſt compact hartſhorns, which ſoon grow ſoft by a philoſophical calcination, as it is called; namely, by expoſing them to the vapour of boiling water, which ſoftens them more effectually than a long continued boiling in the ſame water. Practical obſervations teach us, that a moſt ſtubborn ſuppreſſion of urine from a fault in the kidneys has often been cured by warm bathing. But more eſpecially a warm vaporous bath conduces very effectually to open the obſtructed pores of the ſkin. It was ſaid upon another occaſion in the comment to § 529. N° 2.

in what manner warm vapours might be artificially applied to the body ſo as to excite a ſweat at pleaſure, and that in ſo great a quantity that the ſtrongeſt man could not ſupport thoſe moſt profuſe ſweats for two hours without fainting and falling down in a deliquium. Hence it is evident of how great uſe this method may be when the whole ſkin is dry in acute fevers, and how unhappily then phyſicians urge forward the humours by warm ſudorifics, while the emiſſories of the ſkin are obſtructed. Hence Celſus [o] juſtly pronounces of warm bathing, *Fere adhiberi, ubi ſummam cutem relaxari, evocarique corruptum humorem, & habitum corporis mutari expedit.* "That they ought "to be uſed where the ſkin requires to be highly relaxed, and to call out the corrupt hu"mour and change the whole habit of body."

By frictions.] Of what efficacy friction is in the cure of obſtructions was ſaid in the comment to § 133. N°. 3. more eſpecially if the veſſels have been firſt relaxed, and the offending matter begun to be reſolved by warm bathing and fomenting: for then the impervious particles are comminuted and divided by the alternate compreſſion and relaxation, and by that means become fit to paſs through the narroweſt extremities of the veſſels. But we know that the veins being compreſſed by frictions, accelerate the courſe of the venal blood towards the heart, which is therefore irritated into quicker contractions; ſo that by very violent frictions a burning fever may be raiſed in a cold perſon. Hence it appears that when frictions are uſed to febrile patients, care ought to be taken not to increaſe the motion of the humours by that means which is often already too quick.

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[o] Lib. II. cap. 17. pag. 93.

Hence Celſus [p] juſtly adviſes, *Longa vero frictione uti, neque in acutis morbis, neque increſcentibus convenit, præterquam quum phreneticis ſomnus ea quæritur. Amat autem hoc auxilium valetudo longa, & jam a primo impetu inclinata.* "That to uſe "long continued friction is neither convenient in "acute diſeaſes nor in thoſe ſlowly increaſing, "more eſpecially when ſleep is deſired thereby in "phrenitic patients. For this remedy agrees beſt "with long continued health inclining to take "place of the diſeaſe from its firſt attack." But as it ſerves to open the emunctories in the end of diſeaſes, that the concocted and moveable morbific matter may be more happily expelled, it may be therefore ſafely enough uſed in moderation.

By ſhaving off the hair and cleanſing the ſkin.] The whole ſurface of the ſkin is covered over with an oily liniment, which prevents it from drying up too much by the air, and preſerves it lax and moveable. If this liniment is collected and dried upon the ſurface of the ſkin, it will very apparently obſtruct the free perſpiration, inſomuch that often ſtubborn cutaneous diſeaſes ariſe from thence in filthy people. Cleanlineſs of the ſkin is therefore neceſſary to keep the emunctories of the ſkin free or pervious, and this will be eaſily obtained by warm bathing, waſhing, and then a gentle friction. But in the ſcalp, or that part of the head which is covered with hair, this liniment is moſt abundant, and ſeems eaſily to thicken, whence that fat ſcaly ſcurf often abounds in the heads of the moſt healthy people. If therefore it is required in ſome diſeaſes to procure a very free perſpiration through the ſkin of the head, ſhaving off the hair will be very ſerviceable to that end: and after that the naked ſkin may be very commodiouſly cleanſed by gentle friction or wiping. In thoſe fevers where the morbific matter uſually tends to the head, and excites either a phrenzy or a coma, Sydenham[q] obſerves that nothing is more uſeful than ſhaving of the head in ſuch patients; and then without applying any plaſter, to let the head be covered with a cap not too thick to keep off the external cold. For by this means there is a very free circulation of the humours procured through the external branches of the carotid arteries, which averts the impetus of the blood from the encephalon.

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[p] Lib. II. cap. 14. pag. 89.

But all the means directed in this aphoriſm being performed, *Undique apertum corpus, & perſpirans, & motum, quod conducat, faciet*; "Will "effect all that can be done to render the body "open and pervious throughout, promoting the "perſpiration and free motion of the humours, "as Hippocrates ſays[r]."

## SECT. DCVII.

THAT which ſtagnates at the extremities of the arteries from too great a quantity of blood compreſſing the veſſels, is reſtored to its due motion by leſſening the quantity of blood by phlebotomy, which is indicated to be neceſſary by the ſigns of a plethora (§ 106, to 107.)

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[q] Schedula monitor. de novæ febris ingreſſu, pag 660.

[r] Hippocrat. de locis in homine cap. 10. Charter. Tom. VII. pag. 369.

It was ſaid that the general cure of fevers conſiſted in four indications (§ 598.); namely, the life and powers of the body are to be maintained, the acrid irritating matter is to be corrected and expelled, the lentor or obſtructing matter is to be reſolved and expelled, and laſtly the urgent ſymptoms are to be mitigated. We have already treated of the two former indications, and we come now to conſider in what manner the lentor ought to be reſolved and expelled. But we declared in the comment to § 598. N°. 3. that every obſtacle impeding the free courſe of the blood through the extremities of the veſſels, was compriſed under the general term of a lentor, whether following from ſome fault of the veſſels, of the fluids, or of both together. The method of learning therefore requires us to treat of theſe ſeparately; and therefore in the preſent and following aphoriſm we ſhall ſpeak of removing thoſe obſtacles which ariſe from the fault of the veſſels, and then in the next following aphoriſms we ſhall deſcribe the cure of a lentor ariſing from a fault of the humours flowing through the veſſels.

When a lentor ariſes from a defect of the veſſels, it muſt be from too great a narrowneſs of thei capacity; but this diminution of their capacit proceeds either from a natural contraction o the veſſels increaſed, of which we ſhall ſpeak in th next aphoriſm, or elſe from an external compreſ-ſure of the veſſels from a diſtenſion of the adjacent parts, concerning which we are to treat a preſent. Among the very many cauſes which ma compreſs the veſſels externally, which we reckone up in order at § 112. there is hardly any but th plethoric tumor can take place ſo as by this mean

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to cauſe a febrile lentor; for the other cauſes there enumerated injure only particular parts, and the plethoric tumor only is able to leſſen the capacity of the veſſels throughout the whole body.

For a plethora (as was ſaid afore at § 106. N°. 1.) is too great a quantity of good blood; but the blood properly ſo called, namely the red maſs, is compoſed of the largeſt particles of any in our humours, and therefore it naturally is confined only to the larger veſſels; for although it may enter into the ſmaller veſſels by an error of place when their orifices are dilated (ſee § 118.) yet it cannot paſs through their ultimate extremities or anaſtomoſes, but will there heſitate without being able to move further. The quantity of blood then being increaſed will more diſtend the larger veſſels, and by that means the ſmaller veſſels next adjacent to the larger diſtended ones will be compreſſed and leſſened. The ſanguiferous veins being more lax may be always more eaſily diſtended than the arteries; but when theſe veins are filled with an increaſed quantity of blood, the arteries will meet with more difficulty of diſcharging their blood into them, whence the arteries themſelves will become more diſtended. But ſince in moſt parts of the body, the arteries and veins accompany each other, therefore the diſtended arteries will preſs upon the leſs reſiſting veins, and by that means propel the blood through them towards the right ventricle of the heart, from whence again it will ſoon be propelled into the diſtended arteries. Hence it is evident, that at length almoſt all the blood will be accumulated in the arteries of thoſe who are highly plethoric. But when the contraction of theh eart urges the blood into the now very full arteries, the ſerous and lymphatic arteries which ariſe from the ſanguiferous, will be ſo far dilated as to admit the red blood, as appears evidently in the tunica adnata of the eye, and in the whole ſkin, which is often very red in plethoric people; and thence theſe veſſels alſo being dilated will compreſs the ſmaller adjacent arteriolæ. But when this is alſo accompanied with a fever, the heat thence ariſing rarefies the blood, and therefore all theſe evils will be conſequently increaſed. Thus we ſometimes ſee the whole body ſuffuſed with redneſs, while at the ſame time the roughneſs and drineſs of the ſkin, tongue, fauces and internal parts of the mouth teach that the ſmaller veſſels are impervious, being compreſſed by a true thlipſis or ſtrangulation from the larger veſſels being over turgid with too much red blood.

But the ſigns of a plethora, which denote that this fault attends, have been enumerated before a § 106. N°. 4.

In order therefore to reſtore the due motion anc fluidity to that which ſtagnates at the extremitie of the arteries from this cauſe, it is required tc make a ſudden diminution of the quantity of blood by which the larger veſſels are diſtended, whicl may be moſt commodiouſly done by opening vein (ſee § 106. N°. 6.) But the quantity o blood to be taken away is to be determined by th patient's ſtrength, age, more or leſs plenitude o rarefaction and heat ariſing from the fever. Henc Celſus[s] very well obſerves, where he treats o taking blood from the veins, *Ergo vehemens febris ubi rubet corpus, plenæque venæ tument, ſanguini detractionem requirit.* "Therefore a violent feve "wherein the body looks red and the large vein "ſwelled, requires blood to be taken away."

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[s] Lib. II. cap. 10. pag. 78.

But although the only and moſt neceſſary remedy in ſuch a caſe is bleeding, yet it ſometimes happens in plethoric people, that after phlebotomy, the fever which was before low rages violently; and the reaſon is, that before the quantity of blood was ſo great, and its rarefaction ſo high by the febrile heat, that it ſuffocated all the motion or action of the over diſtended veſſels, which they recover again ſo ſoon as the diſtended maſs is leſſened by bleeding. Therefore in ſuch a caſe the phyſician ought to advertiſe the patient or his friends that there is greater danger of a rupture in the veſſels from their too great fulneſs, to prevent which bleeding is neceſſary; and yet that after a vein has been opened, it muſt be expected that the fever will increaſe, though at preſent it appears mild and ſuffocated. Such a caſe Sydenham [t] tells us happened within his own practice; for being called to a young man who ſeemed to be ready to expire, though at the ſame time the external parts of his body were ſo moderately warm that the patient's friends would not believe Sydenham whenever he affirmed he had a fever: but blood being plentifully drawn, there preſently enued ſo great a fever, that he confeſſes he never aw one more violent, though it ceaſed at length after three or four bleedings. The celebrated Boerhaave in ſpeaking to this aphoriſm, uſed to ell us of a like inſtance which he met with: namey, of a plethoric man who drank a great quantity of wine in the midſt of ſummer, but the next day walking through the ſtreets was ſtruck ſtiff like a tatue; but after a while by a very bold phleboomy he returned to himſelf, but immediately had a violent fever, by the force of which the

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[t] Schedul. monitoria de novæ febris ingreſſu pag. 683.

rarefied blood burſt open the orifice of the vein, although it was ſecured in the uſual manner by ligature, and bled to ſuch a quantity that the next day he was found in bed in a manner ſwimming in his own blood, but at the ſame time well and without any fever.

But in the comment to § 106. N°. 6. it was demonſtrated that only blood-letting conduces to the cure of a plethora, and that no good is to be expected from that diminution of the humours, which is made by abſtinence from food and drink.

## S E C T. DCVIII.

WHATEVER heſitates at the extremities of the capillary arteries from their fibres being contracted with a convulſive force, ſo as to leſſen their capacity too much, is removed and ſet at liberty by relaxing the fibres (§ 53, to 55.) and by removing the acrimony which occaſioned the contraction, (ſee § 35, 36. 54. 66, 67. 88. 102, to 106, 127, 128.) from whence you may be ſupplied with all the means neceſſary in this caſe.

Anatomy teaches that all the arteries of the body (except perhaps thoſe only which belong to the ſubſtance of the brain and cerebellum, and the marrow of the bones) have muſcular coats, which give them a due ſtrength, leſt they ſhould be overſtretched or dilated by the blood impelled into them by the force of the heart, and alſo that by the force of their fibres they might continue to urge forward the blood at the time when the heart is dilating. But the amplitude of the cavity of the arteries is more eſpecially determined by the force of theſe muſcular fibres. If therefore by any cauſe the contraction of theſe fibres is increaſed, the arterial cavity will be leſſened, and the particles of their contained fluid will heſitate chiefly towards the extremities of the capillaries, through which only ſingle globules of the blood paſs in ſucceſſion with ſome difficulty; and therefore a ſmall diminution or contraction of the arterial cavity muſt occaſion obſtruction in theſe parts of the veſſels. But that the fibres of the veſſels may be contracted with a ſort of cramp-like or convulſive force, we are taught by the moſt certain obſervations. If any one ſuddenly comes out of a ſtove into a very cold air, the cutaneous veſſels expoſed to the air are ſo contracted that the perſon immediately turns pale, while the red blood is not able to paſs through the cutaneous arteries contracted by the cold. The ſame alſo evidently appears when the moſt healthy perſon is ſuddenly ſtruck with fear; for they inſtantly reſemble the image of pale death: the cutaneous veſſels being ſuddenly contracted with a convulſive force, repel back the blood into the larger trunks, whence at the ſame time there follows an anxiety or oppreſſion, a palpitation of the heart, fainting fits, *&c.* while the free circulation is impeded through the contracted veſſels.

But whether this contraction of the fibres proceeds from ſuch a ſudden ſpaſm, or from any other cauſe increaſing their force (ſee § 113.) the whole cure will conſiſt in relaxing the fibres, ſo that they may more eaſily give way to the impulſe of the humours, and not leſſen the cavities of the veſſels by their too forcible conſtriction. Every thing therefore ſerving to the cure of too great rigidity of the veſſels and viſcera, and which have been explained in the aphoriſms above cited, will likewiſe conduce to the cure of the preſent caſe. But among theſe nothing is more efficacious than the vapours of hot water, by which remedy only the moſt rigid and inflexible parts of the body may be reſtored to their due ſoftneſs and flexibility; whence it is that in ardent fevers, where the whole ſurface of the body appears dry and rough, it is ſo extremely uſeful for the patient to keep his feet in warm water, and to let the vapours which thence ariſe communicate with the whole naked ſurface of his body. But the vapours of water may be either applied to the external ſurface of the body only, or elſe come into contact with the internal ſurface of the lungs, being drawn into them together with the air: but when the veſſels in the internal parts of the body are contracted with a convulſive force, all thoſe parts ought to be moiſtened and relaxed by watery drinks and the injection of clyſters. It is well known from daily obſervation, of what benefit it is to a perſon ſuddenly affrighted to immediately drink a large quantity of ſome warm watery liquor. For by that means the conſtringed veſſels are well relaxed, and the equability of the circulation returns, which is often wonderfully diſturbed by a cramp of the veſſels induced by ſudden fear.

And by removing the acrimony which occaſioned the contraction.] We ſee plainly that the larger parts of our bodies are violently contracted by the application of acrid ſubſtances, and therefore it ſeems highly probable that the ſame action takes place in the ſmaller parts. If a grain of ſand falls betwixt the globe of the eye and the very ſenſible internal ſurface of the eye-lid, the orbicular muſcle of the eye-lids will then be contracted ed violently even againſt the will. If the fumes of burning ſulphur are drawn into the lungs, that organ immediately contracts itſelf ſo forcibly, that it cannot be dilated by all the endeavours, but there is preſent danger of ſuffocation and death. It was ſaid upon another occaſion ( § 63.) that experiments upon living animals teach us that the inteſtines being lightly touched with ſpirit of vitriol, contract themſelves immediately and ſo cloſe together, as to intercept the leaſt paſſage through their cavity, inſomuch that air itſelf cannot be tranſmitted. The ſame thing happens from arſenic and other acrid poiſons, as Wepfer has demonſtrated in his hiſtory of the Cicuta Aquatica.

When therefore there is reaſon to ſuſpect that the cavities of the veſſels are diminiſhed by a ſpaſmodic contraction of their coats from an acrimony irritating the fibres, every thing will then be uſeful, which can either remove or weaken the acrimony. Diluent and oily medicines, which obtund all acrimony, are here of the greateſt uſe, becauſe they oppoſe every kind of acrimony, and at the ſame time relax the conſtringed fibres: in the moſt ſevere iliac paſſion linſeed oil drank to the quantity of a pound, has ſaved many people out of the jaws of death; and only a plentiful drinking of warm water, and an injection of it clyſter-wiſe, has deſtroyed the ſtrong acrimony of corroſive ſublimate, as we obſerved before from Sydenham (ſee § 605. N°. 6.) But theſe are medicines which avail againſt all acrimony, and at the ſame time relax and ſoften the fibres of the veſſels. But when the particular kind of acrimony is known, which by its irritation increaſed the contraction of the veſſels, then medicines oppoſite to that acrimony muſt be uſed. But concerning all theſe particulars we have treated before at the numbers cited in the preſent aphoriſm, as alſo at § 605. from whence theſe medicines may be therefore taken.

## SECT. DCIX.

THAT which heſitates at the extremities of the capillary arteries through its own viſcid and ſluggiſh nature, may be reſolved by various remedies; the chief of which is the force of the fever itſelf ſo moderated, as that it may be able to diſſolve the febrile coagulum (§ 587, 589, 593, 594.) and therefore this requires the violence of the fever to be governed in ſuch manner, as 1. That it may not be able to produce inflammations, ſuppurations, gangrenes or ſphacelus (§ 592); the danger of which events being at hand appears from the violence of the ſymptoms, more eſpecially of the heat compared with the action of the arteries. 2. That the thinner humours may not be diſſipated by a too great motion of them; which ill effect is known from the drineſs of the noſtrils, eyes, throat and tongue, a hoarſeneſs, dry and rough ſkin, little urine, and the pulſe ſmall, quick and unequal. 3. Nor yet to let the force of the fever ſubſide or languiſh too much before the concoction, whence it might not be able to ſubdue, remove, ſecern and diſcharge the matter of the diſeaſe; as may be known if the vital actions are altogether languid, without any ſign of a concoction yet appearing.

We come now to treat of that lentor or heſitation, which proceeds from the fault of the fluids themſelves flowing through the veſſels. It was ſaid in the comment to § 110. that there is a certain degree of coheſion required in our healthy humours: put ſince the particles of the blood are obſerved to baſs only one at a time through the ultimate extremities of the capillary arteries, therefore the coheſion of one particle to the other in the blood, ought to be ſuch as will yield to the powers by which the humours are drove through the veſſels. When therefore this coheſion of the particles or globules of the blood is by any cauſe ſo increaſed, that it will not yield to the action of the heart and veſſels, it is then called a lentor or viſcidity. But this lentor ſometimes pre-exiſts before the fever ariſes, and ſometimes it happens from and during the fever. Thus we ſee theſe ſpontaneous laſſitudes, which denote an imperviouſneſs of the humours through the veſſels, often precede acute diſeaſes; and on the contrary, that a fever raiſed, for example, by the ſtimulus of the contagion of the ſmall-pox, communicates an inflammatory lentor in the ſpace of a few days to the blood of a perſon who was before perfectly in health. But whether this lentor preceded or followed after the fever, it is ſtill required to be removed in order to effect a cure; ſince otherwiſe the equability of the circulation cannot be reſtored throughout all the veſſels, which yet is abſolutely neceſſary to perfect health. Many remedies are recommended for this purpoſe; but that which merits the greateſt preference to all the reſt, is the force of the fever ſo moderated itſelf, that it may be able to diſſolve the febrile coagulum.

It may perhaps ſeem ſurpriſing that the fever itſelf ſhould occaſion the coagulum, and again diſſolve the coagulum after it is formed; but if we conſider what has been ſaid in the effects (§ 587, and 589.) together with what is related concerning the various events of fevers (§ 593, 594.) it will be ſufficiently evident that both theſe effects of the fever are not in the leaſt contradictory, but actually take place according to the different duration and intenſity of the fever. For we are certain that too violent a force of the fever expels the moſt fluid parts of the humours, and inſpiſſates the reſt, and therefore a lentor enſues in the fluids, or that lentor already formed is increaſed: but in the mean time it is likewiſe evident, that by a moderate force of the fever thoſe humours are attenuated and diſſolved which were concreted, by which means the lentor is removed, as we demonſtrated in the places before cited. All therefore here required is ſo to moderate the force of the fever, that it may not be too weak to diſſolve the febrile coagulum, nor yet to let it be too violent, whereby it may deſtroy the tender ſolids, and coagulate the fluids.

This ſimple method has diſpleaſed many, who have believed it unworthy a phyſician to ſtand ſo often as a ſpectator in the cure of diſeaſes; and not only this opinion, but alſo the ſlowneſs of the advancing cure often excited both the patient and the phyſician to fall into other methods, and to try almoſt every thing to remove the obſtacles, or ſuffocate the fever, the very name of which is odious to the unſkilful. For, ſay they with Aſclepiades, it is the part of a phyſician to cure quickly, as well as ſafely and pleaſantly. But, as Celſus[u] very well obſerves, in treating upon theſe matters, *Id votum eſt: ſed fere periculoſa eſſe nimia & feſtinatio & voluptas ſolet.* "The ſtudying too much of haſte "and pleaſantneſs in the cure of diſeaſes, however "deſirable, is yet commonly dangerous." I wiſh this admonition to be obſerved by thoſe phyſicians, who make it their practice to ſuppreſs indiſcriminately the force of almoſt all fevers by repeated bleeding. Even Celſus [w] complains of the ſame thing in his time, when he ſays, *Sanguinem inciſa vena mitti novum non eſt; ſed nullum pene morbum eſſe, in quo non mittatur, novum eſt.* "It is nothing new to let blood in fevers by opening a vein, but to bleed almoſt in every diſeaſe or fever is a practice new or uncommon." On the contrary, it has been cuſtomary with others to increaſe the febrile motion by the hotteſt medicines, when it is of itſelf already too violent, namely, with a view to diſſipate or carry off the matter from the body by a diaphoreſis; but how raſhly this is often attempted has been ſaid before. Others again diſturb every thing with equal audacioufneſs and ill ſucceſs by purges, vomits, *&c.* But the wiſe antients exactly following the footſteps of nature in the cure of diſeaſes, have placed the beſt method of cure in keeping a fever under a due regulation, and condemned thoſe phyſicians who believed that they did not proceed according to art, unleſs they opened a vein, injected clyſters, *&c.* (ſee concerning this the comment to § 587.) for frequently, as the ancients have well obſerved, the beſt phyſick is not to uſe any. But, leſt the ſlowneſs of the cure ſhould give occaſion for departing from this high and ſecure way, and proceed to try other methods, Hippocrates [x] gives the following ſalutary admonition to his ſucceſſors, *Omnia pro ratione facienti, ſi ex ratione non ſuccedant, non ad aliud tranſeundum eſt, manente illo, quod ab initio decretum fuerat.* "That although things do not ſucceed according "to wiſh or expectation under the care of one who

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[u] Lib. III. cap. 4. pag. 117.

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[w] Lib. II. cap. 10. pag. 77. Charter. Tom. IX. pag. 88.

[x] Aphor. 52. Sect. II.

"proceeds in a juſt and rational method, yet he "ought not to paſs over to another method, ſo "long as that continues which induced him to "proſecute the method at firſt." The incomparable Sydenham, who is never to be mentioned without an encomium, having arrived to the greateſt perfection of art by a diligent attention to diſeaſes, when he ſaw a ſleepy ſtupidity from a lentor of the humours flowing through the veſſels of the encephalon in fevers, confeſſes that he left no ſtone unturned, but tried repeated bleeding, bliſtering, clyſters, *&c.* to remove it, but in vain; whence he ingenuouſly confeſſes that afterwards he made no farther attempts of the like kind, only prohibited his patients from fleſh-meats and ſpirituous liquors of every kind, namely to prevent the increaſe of the fever. But when he attended to learn by what method nature endeavoured to conquer this ſymptom, that he might follow it for the future, he was ſurpriſed to find that the diſorder which he regarded, at laſt diſappeared ſafely though ſlowly. Hence he juſtly concludes, *Nos in morbis depellendis haud ſatis lente feſtinare; tardius vero nobis eſſe procedendum, & plus naturæ eſſe committendum, quam mos hodie obtinuit. Errat enim, ſed neque errore erudito, qui naturam artis adminiculo ubique indigere exiſtimat. Namque id ſi fieret, parcius humano genere ea proſpexiſſet, quam poſtulat ſpeciei conſervatio: cum ne minima ſit proportio inter morborum ingruentium frequentiam, & facultates, quibus pollent homines ad eos fugandos, vel eis ſeculis, quibus medendi ars maximè caput extulit, & a quamplurimis exculta eſt.* "That we do not proceed ſlow enough in removing diſeaſes; and that we ought to advance with "leſs haſte, and commit more to nature than is cuſtomary among us at preſent. For he is in an "error, and not in a learned one, who thinks that

" nature is always to be directed by the aſſiſtances " of art. For if this took place, nature would " have dealt more hardly with mankind, than is " conſiſtent with the preſervation of the ſpecies: " ſince there is not the leaſt proportion betwixt the " number of diſeaſes, and the faculties or powers " with which mankind are endowed to avoid and " ſurmount thoſe diſeaſes; and this even in thoſe " ages, wherein the art of healing has been raiſed " to the greateſt pitch, and cultivated by the " greateſt number of phyſicians [y]."

For nature makes uſe of the fever to ſeparate the pure from the impure, to diſſolve what is concreted, to attenuate and ſubdue what is tenacious and reſiſting, and to expel what is ſubdued from the body by various paſſages, if it can be no longer obedient to the laws of health (ſee the comment to § 558). All this is ſufficiently evident from what has been ſaid before. But although we eaſily know the fever once produced, yet the cauſe which excited it is not always diſtinctly underſtood; but it is only in the phyſician's power to obſerve the effects which from thence ariſe, that he may learn by what methods nature endeavours to conquer the diſeaſe, and by what paſſages the material cauſe of the diſeaſe may be expelled from the body, whether exiſting before the fever was raiſed, or generated by, or during the time of the fever. This being known, he may be able to imitate the method which he has obſerved by art, he may eaſe the paſſages, remove the impediments, and ſupply what is deficient. But ſince nature uſes different ſpaces of time to perform all theſe, requiring only ſometimes a few days, at other times as many weeks, it is again evident that the patient's intereſt is very badly conſulted, if the force of the fever is allayed too ſoon. Hence Sydenham lays down the following general indication in the cure of fevers, *Ut ſanguinis commotio intra modum, naturæ propoſito congruentem, ſiſtatur; ea nimirum ratione, ut nec hinc plus æquo gliſcat, unde periculoſa ſymptomata inſequi ſolent; nec illinc nimium torpeat, quo pacto vel materiæ morbificæ protruſio impediretur, vel ſanguinis, novum ſtatum affectantis, labefactarentur conatus.* "Namely, to keep the motion of the blood within "the due bounds propoſed by nature, ſo that it "may neither riſe ſo high as to be attended with "dangerous ſymptoms, not yet fall too low, ſo as "to hinder the expulſion of the morbific matter, "or obſtruct the endeavour of the blood to acquire "a new ſtate[z]."

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[y] Sydenh. Sect. V. cap. 2. pag. 287, 288.

It will be therefore of the greateſt uſe to know thoſe ſigns by which it may be diſtinguiſhed whether the force of the fever is too violent or too weak; and then thoſe remedies are to be pointed out by which the too great force of the fever may be leſſened, or elſe raiſed when it is too weak.

1. By a fever the motion of the humours thro' the veſſels is increaſed; but then, as we obſerved in the comment to § 592, while the ſides of the tranſmitting veſſels retain the ſame firmneſs, the impetus and velocity of the fluid to be tranſmitted is increaſed, whence neceſſarily follows a greater diſtraction of the ſides of the converging veſſels, which may even burſt from this cauſe. But from a ſudden rupture of the veſſels follows a deſtruction of the circulation of the humours through the part affected with a gangrene and ſphacelus, that is a death of the part; and therefore if the impetus is ſo great as to threaten theſe, it muſt be leſſened. But if the ſides of the veſſels are diſtracted without a rupture, their cavity will be dilated ſo as to

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[z] Sydenh. Sect. I. cap. 3. pag. 61.

admit the groſſer fluids to paſs into the ſmaller veſſels; ſo that obſtruction, inflammation, and all their conſequences may follow from an error of place. But an inflammation ariſing in external parts, from too great a force of a fever, does not require ſo great caution, becauſe if it comes to ſuppuration the matter formed may be diſcharged without danger to life; but when inflammations ariſe from too great a force of the fever in internal parts, it is very evident how much danger attends, and how carefully all the endeavours of art ſhould be uſed to prevent a ſuppuration, and much more a gangrene.

But if thoſe preternatural ſymptoms which ariſe from the fever, as the cauſe in the body of the patient, and yet may be diſtinguiſhed from the fever and its proximate cauſe, are very ſevere and increaſe very ſuddenly in the number and malignity, we juſtly conclude that the force of the fever is too violent, and that it ought therefore to be moderated. But ſince new ſymptoms often precede a future criſis, or elſe the preſent ſymptoms are increaſed, therefore there may be ſome doubt in this caſe; as alſo becauſe ſometimes the worſt ſymptoms ariſe from the malignant nature of the material cauſe of the fever, even though its force is not exceſſive, but is often too languid. But the moſt certain ſign of all that the force of the fever is too great, may be had from the heat which ariſes from the more violent motion and attrition of the parts of the fluids againſt each other, and againſt the ſides of the veſſels (as will be demonſtrated hereafter at § 675): for a great heat [a] denotes a narrowneſs of the veſſels, and thickneſs of the humours, a violent propulſion of them and great reſiſtances about the extremities of the arteries: and therefore it is evident, that when a fever

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[a] Herm. Boërh. Inſtit. Medic. § 968.

ver is accompanied with intenſe heat, there is great danger of a deſtruction of the ſolid parts, more eſpecially of the final veſſels. But at preſent we are able to meaſure the degree of heat in healthy people by the thermometer, and by this means we can ſee how much the violent heat in the febrile patient exceeds that degree; and from that exceſs being known, the different degree of danger may be preſaged.

But it is of great conſequence to know in what part of the body this increaſe of heat is perceived; for ſince by the heat we know that the veſſels ſuffer great violence, the greateſt danger will be where the veſſels are moſt tender, and the moſt neceſſary for the continuance of life. Hence if there is an intenſe heat ſeizes the head of a febrile patient, we have juſt reaſon to fear a delirium, convulſions, or phrenzy often ſuddenly fatal: and therefore that the moſt efficacious remedies muſt be immediately uſed. For this reaſon all the antient Phyſicians ſo much condemn a great heat about the breaſt and præcordia, though the other parts of the body are only moderately warm, or even ſometimes when the extremities are cold. For the vital viſcera with the liver, ſpleen, *&c.* are then known to ſuſtain too great a force from the fever, and therefore the worſt conſequences are to be feared, unleſs immediate relief be given.

2. It was made evident in the comment to § 100 and 587, that too great a quickneſs of the circulation diſſipates the moſt fluid parts of the humours, and inſpiſſates the reſt, and that therefore this is juſtly ranked among the effects of a fever: For the ſecretion and excretion made from the reſt of the humours will be in proportion (*cæteris paribus*) to the quantities of them applied in a given

a given time to the ſecretory and excretory organs; and therefore by too great a violence of the fever, the moſt fluid parts are expelled; and the blood being deprived of its diluent vehicle, grows thick, and begins to heſitate every where about the ſmalleſt extremities of the veſſels; whence again there is danger of inflammation, ſuppuration, *&c.* That there is ſuch a deficiency of the moſt fluid parts of the blood we know, if thoſe parts of the body which are naturally moiſt, begin to grow dry. The whole ſkin is lax, ſoft, and moiſt in healthy people; the internal parts of the noſe are always moiſt, the eyes are continually watered with a very thin lymph; the tongue, palate, fauces and gums are likewiſe equally moiſt. But ſo ſoon as the moſt liquid part of the blood begins to be wanting in fevers, immediately a greater drineſs appears in theſe parts; and hence it is uſual for ſkilful Phyſicians never to leave the patient without firſt inſpecting the internal parts of the mouth. This is the reaſon why Hippocrates in his Prognoſtics, condemns a drineſs of the eyes with a dimneſs or loſs of their ſplendor, which yet proceeds from drineſs: and in another place[b] he ſays, *Denſæ linguæ & aridæ phreneticæ: Perniciosſum autem eſt dentes ſiccari.* "A dry and thick-covered "tongue denotes a phrenzy; but it is pernicious "for the teeth to be dry." And again, *Quibus autem dentibus lentores adnaſcuntur in febribus, febres fiunt vehementes.* "That thoſe have violent "fevers, who have a thick and viſcid matter "growing about their teeth in that diſeaſe[c]." For the ſame reaſon alſo, namely, the too great drineſs of the inſtruments of vocification, the ſhrill voice (ὀξυφωνίη κλαγγώδης[d]) is eſteemed a very bad ſign;

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[b] Prorrhet. Lib. I. textu 3. Charter Tom. VIII. pag. 698. & Coac. Prænot. No. 235, 236. ibid. pag. 865.

[c] Aphor. 53. Sect. IV. Charter. Tom. IX. pag. 169.

[d] Hippocrat. Lib. I. Prorrhet. Charter. Tom. VIII. pag. 732.

and even Hollerius[e] teſtifies, that he never ſaw one recover who had ſuch a voice, which he deſcribes in the following manner; *Eſt autem ſubrauca, ſed acuta fere & ſonora, gravis aliquando. Similis refertur, ſi quis in fictile ſiccum aut cavum ædificium caput immittat, atque inde loquatur.* "That it is ſharp and almoſt ſinging, but with "a little hoarſeneſs, and ſometimes grave, reſembling the voice of one ſpeaking with his head "in a dry earthen veſſel, or in a hollow building." When any perſon has travelled through ſandy countries, under great heats of weather, a drineſs of the fauces occaſions ſuch a kind of voice.

But ſince a great deal of water is diſcharged with the acrid oils and ſalts of the blood ſeparated by the fabric of the kidneys under the form of urine, therefore little urine denotes that the blood circulates through the kidneys almoſt deprived of its watery vehicle, and therefore that there is too great a drineſs throughout the whole body.

But the moſt fluid parts of the humours being diſſipated, the blood now being thicker will paſs more difficultly through the ends of the pulmonary artery; therefore the blood will begin to heſitate and be accumulated in the lungs, through which a ſmall quantity only will be able to paſs into the left ventricle of the heart, which not being ſufficient to dilate powerfully the larger arteries, will occaſion a ſmall pulſe: and becauſe a greater difficulty or reſiſtance ariſes againſt the right ventricle of the heart from the infarction of the lungs, it will not be able to entirely empty itſelf, whence it will palpitate or contract more ſwiftly: hence the pulſe will be very quick as well as ſmall; and laſtly, it will be unequal or intermitting, denoting that life is in a manner deficient at in-

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[e] In Coac. Hippocrat. pag. 155.

intervals from the extreme difficulty of the blood's paſſage through the lungs, whence it is ſufficiently evident how great danger is then preſent.

When therefore the ſigns denote that the violence of the fever is ſo great, that there is danger of the moſt fluid parts of the humours being diſſipated, and that the blood will in a little time heſitate immoveable in the ſmalleſt extremities of the veſſels, therefore the fever ought to be leſſened by all the endeavours of art to avoid theſe fatal conſequences. Hence it is alſo evident how badly the intereſt of the patient is conſulted, when the moſt fluid parts of the blood are expelled in ſweats at the beginning of the diſeaſe. Sydenham affirms, that he always obſerved the very worſt conſequences from this practice in the ſmall-pox; and he aſſures us that the remaining courſe of the diſeaſe turned out the more dangerous, as the Phyſicians had been more aſſiduous in promoting ſweats during the firſt ſtage of the ſmall-pox.

3. In the comment to § 587, where we treated of concoction as an effect of the fever, it was ſaid, that by this term was underſtood ſuch a change of the material cauſe by the fever itſelf as rendered it leſs hurtful, and diſpoſed to be diſcharged conveniently out of the body; but that the febrile motion under a juſt moderation is the principal cauſe of this concoction, is alſo demonſtrated in the ſame place. Whence it is evident, that the fever being ſuppreſſed before this concoction, or ſo weakened that it cannot exert in power, the worſt conſequences may thence follow; not ſo ſwiftly indeed as thoſe which ariſe from a deſtruction of the veſſels and coagulation of the fluids by the raging violence of the fever; but ſlow, chronical, and very difficult diſeaſes often follow when the fever is not ſufficient to move and maturate its material cauſe.

When

When an inflammation raiſed in any part of the body is ſuch that it cannot be reſolved, the beſt thing that can then be done, is to change the inflammatory and inſpiſſated coagulum by a mild concoction into pus or matter: but this can never be performed without a fever; and if this fever in ſuch a caſe happens to be violent, it cauſes a gangrene; if the fever is too low, it is not able to effect a concoction, nor produce a mild ſuppuration, but often an incorrigible ſchirrous hardneſs remains during the reſt of life. After the very hotteſt ſummers, it often happens that in the autumn following, people are afflicted with a ſlight obſtruction of the liver, attended with a ſlow fever ſometimes continual, and ſometimes remitting; and if the fever continues longer, it changes to the claſs of intermittents. When the ſtrength has been too much weakened by frequent and too copious bleedings, all the force of the diſeaſe is indeed ſuppreſſed, but the unfortunate patient languiſhes, and by degrees falls into a cachexy, an obſtinate jaundice, or a dropſy; and ſometimes in the following ſpring a putrid dyſentery immediately weakening the vital powers, has proved fatal. The ſame misfortune alſo happens to many who have been cured of autumnal intermittents by a too haſty uſe of the Peruvian bark. For after the fever is removed the obſtacle remains in the liver, for diſſolving and expelling which the fever itſelf is the greateſt remedy, if kept under a juſt moderation.

But we know that the febrile motion is too low or dull, if the pulſe is languid and weak, the powers ſuppreſſed, the urine of a pale colour, the heat ſmall, and no where more intenſe than in the healthy cold temperature. If under theſe circumſtances there is no ſign that the univerſal or topical diſorder which accompanies the fever is relieved, we then know that the material cauſe of the diſeaſe is not yet ſubdued, and that the impetus of the fever is too weak to ſubdue, move, ſeparate, and expel the ſame. For when the material cauſe is by the fever itſelf diſſolved, and again aſſimilated with the healthy humours, ſo as to circulate with them, (ſee § 595) or the ſame matter being ſubdued and rendered moveable, but being poſſeſſed of ſuch qualities as are repugnant to the equable circulation, it is either expelled from the body, or depoſited upon ſome certain part (ſee § 593, 594); whereupon the febrile motion ceaſes, and with a very ill preſage; nor is there any reaſon then demanding an increaſe of the motion. But when the matter is thus altered, the ſigns of concoction always appear firſt; and for this reaſon it is added in the text, without any ſign of concoction yet appearing. For example, if after bleeding too often repeated in a pleuriſy, there remains a dry cough, or a thin watery humour which cannot be coughed up without difficulty, and the pain, though more obtuſe, continues in the affected ſide, the urine becomes thin and without any ſediment, or remains thick and turbid without depoſiting any thing to the bottom, and at the ſame time there is a weakneſs of the vital actions: I then ſee that the impetus of the fever is too dull or languid, becauſe there is no apparent ſign of concoction, and the local malady peculiar to the diſeaſe remains unmoved. For that a concoction is preſent we know from the decreaſe of the diſeaſe and diminution of the ſymptoms, while at the ſame time the vital powers either remain firm or increaſe, and the injured functions begin to recover their healthy ſtate, while the excreta put on the appearance of thoſe qualities which are obſerved in them during health.

Therefore before theſe ſigns appear, it will be always injurious to depreſs the force of the fever, unleſs it ſhould rage ſo violently as to threaten a deſtruction of the very tender ſolids, and too great an inſpiſſation of the fluids. The heat therefore in ſuch a patient ought to exceed the heat in a healthy perſon, and the quickneſs of the pulſe ought to be ſomething more than natural. At the ſame time it is evident, that no very general rule can be given for the cure of fevers, ſince what is uſeful in one caſe may be highly prejudicial in another. Thoſe are therefore equally criminal who endeavour at the cure of every fever by bleeding, clyſtering, *&c.* with thoſe who upon all occaſions make uſe of cordials, ſtimulating and moving medicines, *&c.* Nor can the Phyſician be ſaid in this reſpect to perform the part of an idle ſpectator, ſince there is need of the greateſt prudence to ſee whether any thing, and what ought to be done. He will be the beſt Phyſician who "orders the in-"offenſive flames of the fever to exert themſelves "eaſily upon the body, and who moderates the "rapidity of its fire by a juſt regimen[f]."

*Innocuas placide corpus jubet urere flammas*
*Et juſto rapidos temperat igne focos*, &c.

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[f] In Carmine præfixo operibus Sydenhami.

## S E C T. DCX.

IF therefore the impetus of the fever is found to be exorbitant, it may be moderated (§ 101.) by abſtinence, a thin diet, drinking of water, a cool air, ſlight affections of the mind, bleeding, cooling clyſters, mild, watery, glutinous, and cooling medicines, with anodynes and opiates. See § 92 to 106.

It now remains to be enquired by what remedies we may moderate the fever, when its impetus is too great. But of this we treated before in ſpeaking of diſeaſes ariſing from exceſs of the circulatory motion. But this is performed chiefly

By abſtinence.] It is not here intended that the patient ought to abſtain from all food and drink, but only from ſuch as either by their quantity or quality may increaſe the blood's motion, which is already too violent.

By a thin diet.] Such as may be eaſily digeſted and moved freely without reſiſtance through all the veſſels. Hence the decoctions of barley, oats, rice, bread, *&c.* are of the greateſt uſe (ſee what has been ſaid in the comment to § 599). For ſince even in healthy people foods of a difficult digeſtion often excite a fever, becauſe they cannot be ſubdued but with great uneaſineſs by the concocting powers, it is ſufficiently evident, that the ſame diſorder ought to be expected more eſpecially in thoſe who are already ill of a fever, where many of the functions to be employed in that office are languiſhing; and therefore only the thinneſt aliments can be adminiſtered, ſince the too great force of the fever ought to be quieted.

Drinking of water.] The greater quantity of water abounds in the blood, ſo much the cooler is the body, and the weaker the powers. In leucophlegmatic and pale girls the blood is found poor, and of an ill watery condition; but then there is obſerved a coldneſs of the whole habit, and great weakneſs. So long therefore as there is too great a heat and quickneſs of the circulation preſent, the drinking of water, more eſpecially warm, can never be hurtful, ſince by relaxing the ſolids and diluting the fluids, it will abate their motion. But at the ſame time, as we obſerved before (ſee § 605, N°. 6.) all acrimony which is ſo frequently the cauſe of an increaſed motion in the blood by its ſtimulus, may be ſo weakened by diluting with water, as to be no longer offenſive. Even every one who is ill of a violent fever, unleſs the mind is diſordered, has by a natural inſtinct a very great deſire for water and watery drinks. Sydenham [g] affirms, that he has cured incipient fevers only by abſtinence and thin drinks, both in his own children and friends, although they were permitted their uſual exerciſe and free air.

Cool air.] It was the opinion of almoſt all the Phyſicians of the laſt age, that all fevers might be cured with the greateſt ſafety and expedition by a diaphoreſis. Hence they detained the patient in a very hot air, covered and even loaded with bed-cloaths, that the ſurface of the body being fomented by the heat, might be better diſpoſed to diſcharge ſweats. But this was adding fuel to fire, to the great damage of the patient, and exaſperating the force of the fever. But more eſpecially they inſiſted upon this method in thoſe fevers which were accompanied with cutaneous eruptions, ſuch as the ſmall-pox, meaſles, *&c.* Sydenham was almoſt the firſt who courageouſly oppoſed himſelf to the torrent of this practice, than which nothing can be more pernicious, as he declares in ſeveral parts of his works. But he found it one of the moſt efficacious remedies for quieting the too great force of the fever, to let the patient abſtain from his bed for a few hours, and ſit with an erect poſture of body in a chair, or at leaſt to put on his cloaths and lie down upon the bed not covered with any other cloaths, if the greater weakneſs prevented from ſitting up; that by this agreeable cooling the too great burning heat of the fever might be moderated [h]. But of ſo great moment is this method, that he affirms, that neither plentiful bleedings nor any other cooling remedies were of ſervice in the cure of pleuriſies, if the patient was perpetually confined to his bed [i]: for the inſpired air ſerves to cool the blood heated by its very ſwift motion through the pulmonary arteries; but if the patient is kept in a very hot atmoſphere by being covered up with bed-cloaths, it is evident enough that none of this cooling can be expected, and therefore the heat muſt be increaſed. To expoſe a heated body ſuddenly to a very cold air would be raſh; but to temperate too great a heat of the body by ſuch things as are recommended at § 605 N°. 2. can never be injurious. But even this is ingenuouſly confeſſed by Sydenham [k], that ſometimes, though rarely, if the patient abſtained from his bed longer at one time than was convenient, eſpecially in the declenſion of the diſeaſe (namely in a continued fever), they would be ſometimes taken with wandering pains, which might terminate in a rheumatiſm; and ſometimes the body would appear diſcoloured, as in a jaundice. But if this happened only in the declenſion of the diſeaſe when the heat is milder; they might then more ſafely have kept to their bed, and have eaſily got over theſe complaints. But it is ſufficiently evident, that caution may be uſed not to let the patient be too long abſent from his bed; and the air where the patient lies may be ſo temperated as to prevent it from doing any injury by its coldneſs.

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[g] Sect. V. cap. 2. p. 284.

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[h] Sydenham pag. 282. [i] Ibid. Sect. VI. cap. 3. pag. 337.
[k] Sect. V. cap. 2. pag. 283.

There is an obſervation in the Memoirs of the Royal Academy of Sciences[1], which demonſtrates how much abſtaining from the bed will ſometimes conduce to a quiet fever. For the febrile paroxyſm inflexible to all known remedies was prevented, if the patient did but ſit up in a chair, and not keep to his bed.

Slight affections of the mind.] That violent paſſions of the mind ſometimes excite fevers of the worſt kind, has been ſaid before in the comment to § 586. N°. 3. for which reaſon paſſions of the mind were reckoned among the cauſes increaſing the quickneſs of the circulation. (§ 99. N°. 1.) When therefore the febrile motion is to be leſſened, it is evident enough that all affections of the mind ought to be moderate; but in what manner they are to be moderated, was ſaid before in the comment to § 104, and 605. N°. 5. Every thing therefore is to be here avoided which can powerfully affect either the external or internal ſenſes; the patient ſhould be kept to a dark chamber, free from all noiſe; that as Celſus obſerves, *Semper ægros ſecuros agere conveniet, ut corpore tantum, non*

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[1] L'An. 1732. Hiſt. pag. 42.

*non etiam animo laborent.* "The patient ought "always to be kept ſecure from diſturbance, that "his mind may not be diſordered as well as his "body [m]."

By bleeding.] What have been hitherto adviſed for the reſtraint of the too great force of the fever, are indeed all of the greateſt uſe, tho' they cannot produce their effects ſo ſoon as we could wiſh; when therefore the violence of the fever is ſuch, that there is danger of deſtroying the very tender veſſels coagulating the humours by diſſipating the moiſture, and increaſing the heat ſo that they cannot afterwards be diſſolved by any art, then the great danger requires the immediate uſe of the moſt efficacious remedies, by which we are certain the febrile motion may be ſoon diminiſhed. But ſuch a remedy is afforded by opening a vein; for we can thereby diminiſh the motion of the humours at pleaſure, even unto death, which is an abſolute reſt of the whole; and therefore we may reduce the force of the fever to a juſt moderation in proportion to the quantity of blood which is drawn. This matter has been demonſtrated by the incomparable philoſopher Dr Stephen Hales, to whom we owe many and great improvements; for after opening the blood-veſſels of living animals, he adapted glaſs-tubes to ſee to what height the blood would aſcend into them by the impulſe of the heart and blood-veſſels. He afterwards remarked how much the height of the blood leſſened after drawing out different quantities until the animal at length expired [n]. From which experiments it appears that leſſening the quantity of the blood weakens the motion of the circulation. But how great efficacy phlebotomy ſometimes has in the cure of fevers, is evident from the remarkable inſtance which was mentioned in the comment to § 54. N°. 2. where Galen ſo happily removed the diſeaſe by one bleeding, but continued to fainting in a plethoric and robuſt youth, that they who ſtood by told him he had killed the fever. Hence in the moſt ardent fevers and great inflammations with intenſe pains, he placed all his hopes in ſuch a kind of bleeding (ſee the comment to § 141. N°. 1.) But altho' veneſection is often required in ſo plentiful a manner 'till the patient faints away in the moſt ſevere and dangerous fevers, yet in other caſes it ſhould be moderate: for if by this means the vital powers are ſo depreſſed as to leave no fever while the lentor ſtill remains, which can only be rightly ſubdued by the fever, a good cure can never ſucceed. If after ſome hours or later the force of the fever begins again to rage, a vein may be opened a ſecond time, and repeated again, 'till the remiſſion of the heat and mildneſs of the ſymptoms indicate that nothing more of danger is to be apprehended from the violence of the fever; but always taking care not to run on the other extreme, that is, not to dull or weaken the fever too much.

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[m] Celſus, Lib. III. cap. 5. in fine pag. 127.

[n] Hales' Hæmaſtatics, p. 1, &c.

But although greater caution ſeems required in the tender infant, in old age, and in women with child (which laſt Hippocrates [o] tells us miſcarry by opening a vein, eſpecially if the fœtus is large); yet even in theſe bleeding ought not to be neglected, if there ſeems any danger from the too great violence of the fever. Sydenham [p] obſerves, that young infants may be ſafely bled in a quantity proportionable to their ſtrength, and I have myſelf often experienced the benefit of it. For, as Celſus[q] well obſerves, *Intereſt enim, non quæ ætas ſit neque quid in corpore intus geratur, ſed quæ vires ſint*, &c. *Cum præcipua in hoc ars ſit, quæ non annos numeret, neque conceptionem ſolam videat, ſed vires æſtimet, & ex eo colligat, poſſit nec ne ſupereſſe, quod vel puerum, vel ſenem, vel in una muliere duo corpore ſuſtineat.* "We are not ſo much to "conſider what the age is, or what is done in the "body, but rather the condition of the powers, "*&c.* becauſe in this the art principally conſiſts, "not in conſidering the number of years, nor the "ſtate of gravitation only, but to eſtimate the "powers or ſtrength of the body; and from "thence one may collect whether the patient can "ſurvive or not, whether in a child, an old per-"ſon, or in a woman who has a growing fœtus "to ſupport as well as herſelf."

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[o] Aphor. 31. Sect. V. Charter. Tom. IX. pag. 213.

[p] Sect. IV. cap. 5. pag. 248.

I am not ignorant that a ſentence, thrown by Celſus[r] in the ſame chapter, has raiſed ſome ſcruple on this account; namely, *Quod ſi vehemens febris urget, in ipſa ejus impetu ſanguinem mittere, hominem jugulare eſt.* "That if a violent fever "urges, to let blood in the height of it is to kill "the patient." But Celſus does not ſeem to know the uſe of bleeding ſo far as it temperates the violence of a fever, but he only recommends it as leſſening the quantity, or removing what is vitiated: for he ſays[s], *Conſiderandum eſt, utrum ſuperans, an deficiens materia læſerit; corruptum corpus ſit, an integrum: nam ſi materia vel deeſt, vel integra eſt, illud alienum eſt. At ſi vel copia ſui male habet, vel corrupta eſt, nullo modo melius ſuccurritur.* "It

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[q] Lib. II. cap. 10. pag. 77, 78.

[r] Ibid. pag. 80.

[s] Ibid. pag. 78.

" muſt be conſidered whether the matter offends " by abounding or being deficient; whether the " body be corrupt or ſound and entire: for if " there is a deficiency of matter, or a ſoundneſs " of body, bleeding is improper. But if the patient is indiſpoſed from too great a quantity or " a corruption of the humours, there is no better " way of relieving him." But when Celſus pronounces bleeding dangerous, he ſpeaks of the height of the fit in an intermitting or remitting fever; whence he immediately ſubjoins, *Expectanda ergo intermiſſio eſt, ſi non decedit, cum creſcere deſiit: ſi neque remiſſio ſperatur, tunc quoque, quamvis pejor, ſola tamen occaſio non omittenda eſt.* " That an Intermiſſion is therefore to be waited for, or at " leaſt a remiſſion, if the fever does not go entirely off: but if neither a remiſſion can be " hoped for, then indeed a ſingle or neceſſary " call for bleeding ought not to be neglected, " though it may be worſe[t]." From whence it is evident that he does not abſolutely condemn bleeding even in the height of fevers. Nor is this caution which he gives us without its uſe in fevers which intermit or remit; for in the greateſt height of a quartan, for example, there is often a very intenſe heat with a delirium and many other ſymptoms which require bleeding, unleſs one is aſſured that the violence of the fever will ſpontaneouſly go off in a little time; but then in general, bleeding is in itſelf always pernicious for intermitting fevers, as we ſhall declare hereafter at § 762.

But as bleeding ſerves thus to abate the violence of the fever, it is evident that no time can be preſcribed beyond which it cannot be uſed without ſucceſs. For in whatever time of the diſeaſe the fever rages ſo as to threaten the evils before mentioned,

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[t] Ibid. pag. 80.

tioned, (§ 609. N° 1, 2,) bleeding will be both uſeful and neceſſary. But it is indeed true that in curing inflammatory diſeaſes by reſolution, after the fourth day bleeding is ſeldom uſeful, becauſe the obſtructing matter is by that time too much confirmed and ſtrongly wedged into the veſſels to admit of being reſolved; and then there only remains a proſpect of ſeparating the inflammatory matter by a mild ſuppuration, which is always accompanied with a fever, and uſually a more intenſe one, and the force of which ought therefore not to be diminiſhed as it forwards the ſuppuration. And in this caſe only can that advice of Celſus [u] hold true, where he ſays, *Sanguinem mittere nunquam utile eſt poſt diem quartum, cum jam ſpatio ipſo materia vel exhauſta eſt, vel corpus corrupit, ut detractio imbecillum id facere poſſit, non poſſit integrum.* "That it is never uſeful to bleed after the fourth day, ſince after that ſpace the matter is either exhauſted or the body vitiated by it, ſo that taking blood from the patient then may weaken him but cannot reſtore him." But even in theſe caſes, if the fever is ſo violent as to endanger a ſudden rupture of the ſmall veſſels by its too impetuous motion, (ſee § 388.) then a gangrene may be feared inſtead of a mild ſuppuration, and the fever ought to be reduced to ſuch a degree of moderation as is required for a laudable ſuppuration. For it frequently happens that continual fevers are very mild for the firſt days, and afterwards they rage with great violence. (See the comment to § 564.) Hence Galen [w] juſtly pronounces, that we are not to attend to the number of days in blood-letting; *Quocunque enim die mittendi ſanguinis ſcopos in ægrotante inveneris, in eo illud auxilium adhibeto,*

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[u] Ibidem. [w] De curandi ratione per venæſectionem cap. 20. Charter. Tom. X. pag. 449.

*etiamſi vel vigeſimus ab initio is exſtiterit.* "For "on whatever day you meet with ſigns in the pa"tient which require bleeding, you ought to af"ford him that help immediately, even though it "ſhould happen to be on the twentieth day from "the beginning." But the indications for this conſiſt in the violence of the diſeaſe and ſtrength of the powers. For I well remember myſelf to have ordered bleeding much later than this with ſucceſs.

Cooling clyſters.] This after bleeding is another moſt efficacious remedy, whereby the too great force of the fever may be temperated. But we here ſpeak only of thoſe clyſters capable of introducing a coolneſs throughout the body, when it is too much heated by a violent fever. For it is well known that purges and vomits with any other kind of medicine may be advantageouſly applied this way. Sydenham † eſteemed clyſters ſo much, that he affirms he could quiet the too great heat of the blood at pleaſure only by the uſe of theſe, and that he had ſeldom occaſion for repeated bleeding in continual fevers, unleſs in thoſe which happened to people of a ſanguine temperament, or in the flower of their age, or indulging themſelves too much in wine: but in others it was ſufficient to inject a clyſter every day, or every other day, as the force of the fever was greater or leſs, until the violence of the diſeaſe was ſufficiently reduced, as it uſually happened about the tenth day, eſpecially in the common acute continual fever, which terminated in fourteen days. But in thoſe whom he durſt not bleed he continued to uſe clyſters to the fourteenth day; and ſuch were thoſe patients who had a continual fever after they had not been well cleared from autumnal intermittents. For in theſe he had ob-

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† Sect. I. cap. 4. pag. 69.

obſerved blood-letting pernicious, which induced him to ſubſtitute the uſe of clyſters in its ſtead. This is alſo well pointed out by Celſus [x], when he ſays, *Clyſmata uſum habere, ſi ſanguinem mitti, cum opus ſit, vires non patiuntur, tempuſve ejus rei præteriit.* “That the uſe of clyſters “takes place if the ſtrength will not admit of “bleeding when it is neceſſary, or if the time for “bleeding has expired.” Sydenham only made uſe of the moſt ſimple clyſters compoſed of Sugar and an emollient decoƈtion; ſometimes only of water, or of water mixed with an equal quantity of milk. All theſe kinds of clyſters cheriſh the bowels like an emollient vaporous bath, waſh out the fæces, dilute what is abſorbed by the venal orifices, and reſolve the concreted humours by the ſaponaceous virtue which reſides in ſugar or honey; and thus by all theſe powers conſpiring together, they allay too great motion of the humours, and that ſo effeƈtually that Sydenham cautions phyſicians againſt the abuſe of them, leſt being unacquainted with their efficacy they ſhould too much depreſs the febrile motion; whence ſometimes ariſe very irregular ſymptoms and new diſturbances, when the diſeaſe which was judged ſubdued is kindled again and creates great difficulties. Various forms of clyſters may be ſeen in the materia medica of our author correſponding to the number of the preſent aphoriſm; to moſt of which nitre is added on account of the ſingular cooling virtue which it has.

Mild, watery, glutinous, and cooling medicines.] When the fever was reduced to its proper degree of force by the preceding remedies, Sydenham [y] gave no other medicines, unleſs he was forced to give ſomething by the importunity of the patient or

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[x] Lib. II. cap. 11. pag. 85.   [y] Seƈt. I. cap. 4. pag. 75.

or his attendants, which he took care ſhould be ſuch as would not diſturb the moderate force of the fever then preſent. But in the mean time while the preceding remedies are acting, it will be convenient to give ſuch internal medicines as conduce to the ſame end. How uſeful the drinking of water is in this caſe has been lately obſerved; but water alone eaſily eſcapes and runs through the body either by urine or ſweat, more eſpecially when there is an inflammatory lentor in the blood. Such things therefore will be uſeful as communicate a ſlight degree of tenacity to the water, that it may better adhere to and be confined within the parts, ſo as to more effectually moiſten them which are too much parched by the febrile heat: hence decoctions of oats, barley and the like, with the addition of honey, ſugar and nitre, are of the greateſt uſe: and although decoctions of hartſhorn, ivory, and the like parts of animals communicate almoſt the ſame tenacity to water, yet they are leſs commendable for this purpoſe, becauſe they too much incline to putrefaction, which is always to be feared in a violent fever. But all theſe laſt mentioned or internal medicines do in effect cool at the ſame time; becauſe they relax the veſſels, dilute the humours, diſſolve concretions and ſheath all acrimony; and thus they leſſen the too great attrition betwixt the veſſels and their humours, weaken the irritating ſtimuli, and that way remove the cauſes of too great heat.

With anodynes and opiates.] All the forementioned remedies being firſt uſed, if the too great violence of the fever does not yet ſubſide, a recourſe may be ſafely had to theſe laſt. But in the beginnings of acute fevers theſe medicines ought not to be uſed, becauſe alone they are not able to mitigate the fever, although they are given in a large doſe, and Sydenham [z] has ſometimes remarked the uſe of them to be miſchievous. He obſerves that a phrenzy in an acute continual fever happily yielded to theſe medicines after the twelfth day of the diſeaſe; but that if they were given ſooner they never proved uſeful. But how great efficacy theſe medicines have in reſtraining the too great violence of the fever, if they are given at a convenient time, is evident more eſpecially in the cure of the ſmall-pox. For, as we ſhall declare more at large hereafter when we come to treat of that diſeaſe, Sydenham confeſſes that he was not able to moderate the raging force of the fever by any other medicine than liquid laudanum, and that given every eight hours, if the violence of the diſeaſe ſeemed to require it. Whenever he gave a purge or a vomit in fevers, he always ordered an opiate in the evening to quiet the tumult which they raiſed; and by this method he uſed theſe evacuations with ſafety, which could not have been done without. See likewiſe what has been ſaid of opiates in the commentaries to § 202, 229. N°. 2. Hitherto may be likewiſe referred thoſe comments which were given under the head of diſeaſes ariſing from an exceſs of the circulatory motion.

## SECT. DCXI.

If the febrile motion be found too low or dull, it may be raiſed by the uſe of cordials taken as food, by ſtronger drinks, by an air a little warmer, by raiſing more the paſſions of the mind, and by the uſe of more acrid, volatile, aromatic and ferment-

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[z] Ibid. pag. 81, 82.

ed medicines with frictions, heat, muſcular motion, warm baths and fomentations.

But when the force of the fever appears too weak or low, ſo as to be unable to ſubdue, move, ſeparate and expel the material cauſe, then there is occaſion for ſuch remedies as may excite or raiſe the too weak motion, ſo far as to enable it to produce the forementioned effects; yet with ſuch moderation that the humours may not be diſſipated by too much increaſing their motion, nor the tender ſolids deſtroyed.

But as the heart is the principal cauſe of all thoſe motions from whence the vital powers are eſtimated, therefore thoſe remedies which ſerve to increaſe the motions are termed cardiacs, although they are not immediately ſubſervient to the heart only; nor is the term cardiac always uſed in ſuch a ſenſe by the antients; ſince by this name they often call ſuch patients as have a diſorder in the ſtomach [a], and eſpecially in its upper orifice, which they denominate *cardia*, (ſee the comment to § 63.) and therefore the remedies proper to this diſeaſe may be allowed the denomination of cardiacs. But at preſent it has been cuſtomary among us to denominate ſuch remedies cardiacs as recruit the vital powers, and therefore increaſe the too weak motion of them through the veſſels.

But cardiacs are ſuch as either increaſe the quantity of good juices in the body, or ſuch as render the action of the moving cauſes more powerful; and ſuch are chiefly the following.

By the ſtronger meats and drinks.] For here every thing is required which is perfectly oppoſite to thoſe mentioned before in the preceding aphoriſm, in which it is ſaid that the force of the fever might be beſt allayed when too violent by abſtinence, a thin diet and drinking of water. When therefore this motion being too languid requires to be raiſed, ſtronger foods and drinks will be of ſervice. But the ſtrength of food is meaſured partly by the quantity of nouriſhment which it has, and partly from the greater or leſs coheſion of its parts which reſiſt the digeſtive powers. But it has been often obſerved before, that the motion of the humours may be increaſed and a fever raiſed even in healthy people from taking great quantities of food, eſpecially ſuch as is of difficult digeſtion; hence therefore the ſame conſequence may be juſtly expected in patients in whom the powers, being weakened by diſeaſe, are leſs able to digeſt and change the aliments. Hence appears the reaſon why Hippocrates ſays (ſee § 602, N°. 5.) *Imbecilles diætæ frigidæ, valentes vero calidæ.* "That "weak patients ſhould be ſupplied with a diet "of cooling food, but the ſtrong with heating "food." But it is ſufficiently evident that care ſhould be taken to avoid giving ſuch food, as being incapable of digeſtion in a weak body would ſpontaneouſly tend to corrupt. Therefore fleſh broths ſeaſoned with agreeable ſpices, cuſtard or eggs dreſſed in a form capable of being ſupped, &c. will anſwer this intention; but a ſevere abſtinence from all theſe was enjoined by Sydenham to his patients, ſo long as any danger was threatened from too great a motion of the fever either preſent or future. But among all cordials which increaſe the motion of the humours, wine bears the preference, which by its agreeable nature and friendly ſtimulus raiſes the languiſhing powers, and increaſes the too ſlow motion of the humours.

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[a] Alex. Trallian. Lib. VII. cap. 9. pag. 341. Cælius Aurelian. Acutor. Lib. II. cap. 30.

The like effect may be likewiſe had from ſtrong ale, more eſpecially when it has been rendered fragrant and ſpirituous by a due fermentation. But all theſe ought to be adminiſtered in ſmall quantities and by degrees, leſt a ſudden alteration ſhould happen towards the oppoſite extreme; and a careful attendance muſt be given to the effects following from the uſe of theſe, that from thence one may be able to determine whether the quantity of them ought to be increaſed or not.

An air which is a little warm.] How much the heat of the air in which the patient reſides, may conduce to increaſe the force of the fever, we have already ſeen in the preceding aphoriſm; and it was there likewiſe remarked that without a due coolneſs of the air bleeding, clyſters, and the other endeavours of art would be of little efficacy towards quieting the too exorbitant force of the fever. It is therefore ſufficiently evident that too low a fever may be raiſed by a hotter air.

By raiſing more the paſſions of the mind.] How much the paſſions of the mind may conduce to increaſe the quickneſs of the circulation was ſaid before in the comment to § 99. But ſince by the moſt intenſe paſſions of the mind very ſudden and violent alterations may happen in the body, therefore the greateſt prudence is here neceſſary to prevent the riſe of ſuch diſturbances as would be afterwards very difficult to allay. Although anger is therefore able in the weakeſt perſon to excite a heat and an increaſed motion of the humours, yet this paſſion can hardly be convenient here, or at leaſt it will be required only to be of a ſlight and ſhort duration; but moderate joy and the hopes of an approaching cure with deſire are here the chief and ſafeſt incentives, as they generally increaſe the motion of the humours, and do not in the mean time diſturb the mind. When Galen [b] remarked the alteration of the pulſe ariſing from paſſions of the mind, he obſerved; *Iræ altus eſt pulſus, magnus, vehemens, celer, & denſus. Lætitiæ magnus & rarus.* "That in anger the "pulſe is high, large, ſtrong, quick and hard or "reſiſting; but that in joy it is large and ſlow, "*&c.*" But we ſeldom want ſo violent an increaſe of the febrile motion as may be raiſed by anger, and which often cannot be excited without danger; but generally a moderate paſſion of joy will ſuffice.

By the uſe of more acrid, volatile, aromatic and fermented medicines.] It is the property of all ſpices when taken into the body to irritate the moving fibres and veſſels by their ſtimulus, and by that means to increaſe the action of the veſſels upon their contained fluids, in conſequence of which follows a quicker circulation of the humours through the veſſels. By an imprudent uſe of theſe a fever may be raiſed even in a healthy body, as we have already ſeen in the comment to § 586. N°. 1. and therefore the ſame effect may be much more expected when there is a febrile diſpoſition already preſent, but too languid; but here more eſpecially ſuch things will be uſeful as have a volatile fragrancy, and are diſpoſed by the heat of the body to be diffuſed every way throughout; for thoſe which have a very fixed acrimony not eaſy to be diſſipated, ſuch as pepper for example, are leſs ſafe to be uſed, becauſe they often continue their action too long, and too much increaſe the violence of the fever, which is always more dangerous than a weakneſs of it. For if the fever is too low, there is danger of a laſting weakneſs and chronical diſeaſes, which yet are often curable: but when the fever rages with too great violence, it often cauſes ſudden death by deſtroying the moſt tender veſſels; or by too much inſpiſſating the fluids ſuch diſorders ariſe as cannot be afterwards removed by any art. Hence therefore, though the whole cure hinges upon a due moderation in the courſe of a fever, yet we ought rather to govern its impetus ſo as to make it leſs than greater than it ſhould be; becauſe thus there will be leſs danger, and the ſlighter error in this reſpect may be more eaſily corrected. For this reaſon ſcordium, balm, rue, citron peels and the like, are in this caſe preferable to more acrid medicines; and hence we generally abſtain from the ſtrongeſt of theſe medicines, unleſs the patient be from his natural habit and age inclined to coldneſs. But all theſe ſtimulating medicines are never to be uſed in the beginning, but only towards the end, when the force of the fever is declining, and then they have often very happy effects. Hence Sydenham [c] in treating of the cure of continual fevers ſays, *Cum autem finem ſpectat, atque declinationem, ſecretione jam conſpicua, tunc quidem calidioribus medicamentis illam a tergo inſequemur, ad rem eò celerius ac certius perficiendam:* "But when the "fever approaches towards its declination and "end, a ſeparation of the matter beginning to ap-"pear, then indeed we may follow it cloſely with "the warmer medicines to accompliſh the end "ſooner and more effectually:" and he alſo obſerves, that if cordials are neceſſary in the beginning of the diſeaſe, only the milder kind of them ought to be uſed, gradually proceeding to ſuch as are warmer, according to the progreſs of the diſeaſe or degree of intenſity in the febrile motion; but affirms that he had obſerved leſs danger from the uſe of the ſtronger cordials, if the patient had been firſt weakened by a plentiful blood-letting, or by old age, than if the patient was in the flower of his age and no evacuation preceded. For in young people, as he well expreſſes[d] it, *Domi naſcuntur cardiaca*; & *quæ foris adduntur, aut fruſtranea ſunt, aut etiam damnoſa.* "They "have cordials in themſelves; and thoſe which "are added externally are either uſeleſs or per- "nicious:" But on the twelfth day of a continual fever which uſually terminates in fourteen days, he indulged the uſe of the warmer cordials, being certain that by this means he accelerated the concoction of the febrile matter.

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[b] De pulſibus ad Tyrones cap. 12. Charter. Tom. VIII. pag. 8.

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[c] Sect. I. cap. 4. pag. 72, &c.

Now the number of cordials both ſimple and compound is very great; many of which ſtand ready prepared in the ſhops, and of which a large catalogue may be ſeen at § 1112. in the Inſtitutes of our celebrated author[e], from whence preſcriptions may be formed of various kinds according to the different age, ſex, temperature, ſtage, and continuance of the diſeaſe, ſeaſon of the year, *&c.* But ſeveral ſpecimens of ſuch forms of medicines may be ſeen in our author's *Materia Medica* at the number correſponding to the preſent aphoriſm. A moderate uſe of wine has the moſt happy effects in theſe caſes; and this only is preferred to other cordials in the cure of the ſmall pox to excite the languiſhing powers, as we ſhall declare hereafter.

With frictions.] From what was ſaid in the comment to § 28. N°. 2. and § 606. concerning frictions, it is evident that by this means the motion of the humours may be accelerated through the veſſels to any degree, either throughout the whole body or any particular part. It was alſo obſerved from Celſus, that frictions were not uſeful while the diſeaſe was in its increaſe, but only in the decline. But as it had been a maxim with many phyſicians, that all helps are neceſſary in the increaſe of diſeaſes, and not when they are terminating of themſelves, therefore Celſus very well adds[f]: *Poteſt enim morbus, etiam qui per ſe finem habiturus eſt, citius tamen adhibito auxilio tolli; quod duabus de cauſis neceſſarium eſt: & ut quam primum bona valetudo contingat, & ne morbus, qui remanet, iterum quamvis levi de cauſa exaſperaretur.* "That a diſeaſe which is about to terminate of itſelf may yet be brought to a period ſooner by the uſe of proper helps, which are therefore neceſſary upon two accounts; namely, that a good ſtate of health may be reſtored as ſoon as poſſible, and to prevent the diſeaſe not thoroughly removed from breaking out again and becoming worſe even upon a ſlight occaſion." But he adviſes frictions to be uſed for removing the remains of diſeaſes; and which are ſerviceable, inaſmuch as they make a ſalutary increaſe of the circulating motion of the humours towards the end of diſeaſes, and alſo becauſe they ſerve to open the emunctories (ſee § 606.) through which the matter of the diſeaſe being rendered pervious and moveable, ought to be ſecerned and expelled.

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[d] Sect. I. cap. 4. pag. 71, &c.

[e] Inſtitut. Med. H. Boerh. § 1112.

By Heat.] Concerning this we treated but a little before.

By muſcular motion.] For when the muſcles act, the incumbent veins are ſooner emptied, and by that means the venal blood is more ſwiftly moved towards the heart, which therefore contracting itſelf quicker excites a fever when there is none, or increaſes it when preſent. But this remedy is ſeldom uſed, becauſe the patient being weakened is indiſpoſed for exerciſe or muſcular motion.

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[f] Lib. II. cap. 14. pag. 89.

By warm baths and fomentations.] Moiſt warm bathing and fomenting rather weaken and leſſen the force of the fever by relaxing the veſſels, as they apply warm watery vapours to the ſurface of the body. But a greater heat being thus raiſed in the blood, and eſpecially if they are compoſed of aromatic infuſions or decoctions, they may by a ſtimulus increaſe the motion of the humours; beſides which, there is alſo dry bathing, which acts by the heat of the ambient air increaſed without moiſture; and there are alſo fomentations of the like kind which produce their effects almoſt only by heat. Celſus alſo recommends for the ſame uſes, *Milium, ſal, arena, calefacta & in linteum conjecta, etiam ſolum linteum, ſi minore vi opus eſt: calido oleo repleti utriculi, vaſa fictilia aqua calida repleta*, &c.[g] "Millet, ſalt, ſand, &c. heated and "applied in a linen cloth, as alſo linen clothes "only, if there is occaſion for leſs warmth; like-"wiſe bladders filled with warm oil, earthen veſſels "filled full of warm water, &c." But when every thing is in too languid a condition by depreſſing the force of the fever too much with the uſe of coolers too long continued, and eſpecially in people far advanced in years ſo as to prolong a fever beyond forty days, which uſually terminates otherwiſe in the ſpace of a fortnight; and if cordials and ſtrengthening remedies have been adminiſtered without effect, the fever remaining obſtinate to all theſe means, or if there ſeems to be an intermiſſion of the febrile heat, the powers remaining greatly weakened; in that caſe Sydenham [h] has obſerved the application of the heat only of ſtrong young people of the greateſt uſe to ſuch patients; for only by that remedy the weakened powers are ſo much recruited as to free the body from the matter which remained to be ſecerned and diſcharged to reſtore health. Nor can theſe effects be aſcribed only to heat in this caſe, becauſe Sydenham had experienced that the application of warm linen clothes, though often repeated, never produced the like ſalutary effects. For the moſt ſubtle part of the humours exhaling from a healthy young body, are thus plentifully derived into the patient weakened from a deficiency of the moſt ſubtle and elaborated fluids, when at the ſame time a moderate warmth and moiſture is equably and continually applied to the languiſhing parts not ſtrong enough in themſelves to maintain a due warmth. But concerning the happy uſe of this remedy in the weakeſt people, we treated before on another occaſion in the comment to § 101.

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[g] Lib. II. cap. 17. pag. 95.

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[h] Sect. I. cap. 4. pag. 79.

## SECT. DCXII.

AFTER the firſt remedy (§ 609.) which removes the viſcidity, the next is to reſtore the elaſticity of the veſſels, by leſſening the quantity of their humours, by a copious and free blood-letting from a large orifice; and afterwards, or at the ſame time, increaſing its motion by ſtimulating remedies.

Our blood, even in a healthy ſtate, is ſo ſtrongly inclined to a concretion, that it immediately congeals as ſoon as it has acquired a ſtate of reſt out of the veſſels; but the rapid motion of the blood through the veſſels, and the continual change in the ſituation of its particles drove through the converging veſſels, and by that means continually ſtriking againſt the ſides of the canals, are the cauſes which hinder the particles of the blood from continuing one moment in the ſame contact, and which therefore prevent them from concreting and uniting together into a ſolid maſs. But there are two diſtinct cauſes acting alternately, whereby our humours are propelled through the arteries, namely, the contraction of the heart filling the arteries, and the contraction of the arteries themſelves the moment after they are diſtended, propelling the blood through the ultimate and ſmalleſt ends of the arteries into the veins. But the action of the arteries urging forward the blood, proceeds from a contraction, wherein the fibres diſtended (with the blood, impelled by the force of the heart) into a greater arch, ſhorten themſelves by their own elaſticity when the diſtending cauſe ceaſes, and diſpoſing themſelves in right lines, approach nearer the axis of the veſſel, ſo as to diminiſh its cavity and propel forward the contained humour. But if there is ſo great a plenitude in the veins that they cannot moſt commodiouſly receive the blood impelled from the arteries, then the fibres of the arteries over-ſtretched by the diſtending blood cannot ſhorten themſelves, but continue ſtrained, whence the ſtrength of the fibres will be weakened, as we demonſtrated before in the comment to § 25, N°. 3. But a weakening of the ſtrength of the fibres will alſo leſſen their elaſticity (ſee § 30.) The ſame thing will be alſo true, if the humours meet with a difficult paſſage through the ends of the arteries, whether from a fault in the humours to be tranſmitted, in the veſſels themſelves, or in both together.

But how great a power the force of the veſſels has in diſſolving the concreted particles of the blood, and in preſſing forward the contained fluid by leſſening their cavity, is more eſpecially evident from the elegant obſervation of Lewenhoeck, mentioned before in the comment to § 131. For he ſaw a particle of concreted blood filling the whole cavity of a ſmall artery in the wing of a bat, which was at one time protruded forward in the artery, and ſoon after again repelled back by the contraction of the artery, becauſe it was not ſmall enough to paſs through its converging extremity; and thus at length the concreted maſs by frequent attrition and returns, was ſo diſſolved as to paſs through the ultimate extremity of the artery into the vein.

But the elaſticity of the fibres over-ſtretched cannot be reſtored but by removing the diſtending cauſe. But this may be done beſt by a copious and quick bleeding from a large orifice in a vein, concerning the efficacy of which ſee what has been ſaid in the commentary to § 133, N°. 1. where we treated on the cure of obſtructions ſo far as it depends upon the remedies which reſtore the reciprocal motion of the veſſels. Moreover, when an impervious fluid ſtagnates, impacted into the narrow extremity of a ſmall artery, it may by the contraction of the artery be preſſed back towards its larger capacity, unleſs hindered by the force and quantity of the humours urging behind: but by a copious and ſwift bleeding from a large orifice, the quantity and impetus of the blood is conſiderably leſſened, and therefore ſuch an evacuation may be extremely uſeful in this reſpect. See what has been ſaid in the comment to § 141, where we treated more at large concerning this effect of blood-letting.

After the veſſels are thus depleted, it will be convenient to adminiſter ſuch remedies as by a gentle ſtimulus increaſe the circulation, that the viſcidity in the humours may be attenuated by the repeated action of the veſſels. For the veſſels being too much diſtended, may loſe ſo much of their force as to be ſcarce any longer able to exert their action. Thus the bladder becomes paralytic by retaining the urine too long, and loſes all its contractile force. But by theſe ſtimulants the veſſels are excited into ſtronger and more frequent contractions. See what has been ſaid upon this ſubject in the comment to § 133, N°. 4. Nor is there any great danger of too much increaſing the circulation by the uſe of ſtimulants, when a plentiful blood-letting has been premiſed, becauſe all prudent phyſicians refrain from the uſe of the more ſharp and heating ſtimulants in ſuch a caſe, wherein the milder kinds can never do any harm. Hence Sydenham[i] ad-

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[i] Sect. I. cap. 4. pag. 73.

adviſes phyſicians to be always mindful, that even the ſtronger cordials may be given with ſafety in acute diſeaſes, if a plentiful bleeding has been premiſed. Nor is this a wrong ſtep in art, as ſome have raſhly believed; namely, in weakening the patient firſt by bleeding, and then by endeavouring to increaſe the blood's motion by ſtimulants, which was violent enough even before this evacuation. For by a copious and quick bleeding the impervious viſcid matter may be derived by a retrograde motion into the larger veſſels, ſo as to ſet the obſtructed parts at liberty: and this being done, the humours may be more ſafely put into a greater motion through the veſſels, which could not be done without injury before the obſtacles were removed.

## SECT. DCXIII.

THIRDLY, the ſame viſcid matter is rendered fluid by diluting with watery drinks, baths, fomentations, and clyſters, and with frictions at the ſame time.

If water can interpoſe itſelf betwixt the particles of the blood too ſtrongly cohering, its coheſion will be diſſolved, and the viſcidity will be leſſened or entirely removed. This is what we call diluting, and with reſpect to our humours almoſt the only diluent is water, concerning the efficacy of which in this caſe ſee what has been ſaid in the comment to § 134 and 135, N°. 1. But water and ſuch remedies wherein water abounds, may be applied to the body, and mixed with our humours in all the forms mentioned in the preſent aphoriſm; and the action of it may alſo be determined at pleaſure towards any particular part of the body, if that is required by a topical diſorder: but this determination of the diluent water may be obtained by ſuch medicines as derive, attract, and propel, as we have demonſtrated in the ſeveral places before cited. But when the diluent water is once mixed with the blood, frictions are a capital remedy; for by this means, the matter contained in the veſſels is put into motion, and ground together with what ought to be diſſolved by the diluting power of the water. The motion of the humours may be likewiſe increaſed by frictions, either throughout the whole, or ſome particular part of the body, as we ſaid before at § 611. See alſo what has been ſaid concerning the efficacy of frictions in removing obſtructions in the comment to § 133, N°. 3.

## SECT. DCXIV.

THE laſt-mentioned remedies will better accompliſh their action, if aſſiſted by drinking of ſaline waters and liquors made hot, with the aromatic, bitter, and lacteſcent juices of plants drank cold.

The febrile viſcid is often of ſuch a nature that water can either not at all, or elſe very difficultly inſinuate itſelf betwixt the cohering particles. The truth of this ſometimes appears with a very bad preſage in acute inflammatory diſeaſes, where diluents drank even in a large quantity, and applied to the body in the form of a clyſter, bath, fomentation, *&c.* prove of no ſervice; but all the ingeſted water runs out from the body, either by the paſſages of the urine or ſweat, leaving the ſame inflammatory tenacity ſtill remaining. There is therefore frequently occaſion for other helps, which being mixed with the water, may by their attenuating force fuſe and divide the viſcid matter, and by that means procure a paſſage to the water, that it may interpoſe itſelf betwixt the now ſeparated particles that they may not eaſily unite again. For this reaſon, in the cure of obſtructions ariſing from the coheſion of the particles together in the fluids, ſuch things as attenuate were alſo recommended, beſides thoſe which dilute (ſee § 135); and more eſpecially among theſe, ſalts and ſoaps are uſeful in this caſe. But among the ſalts, nitre, ſal prunel, ſal polychreſt, and the like, prepared of nitre, are recommended before the reſt, becauſe it is almoſt the lighteſt among ſalts, is alterable by the powers of the body, and cooling without too much increaſing the motion of the humours by its ſtimulus, and at the ſame time it moſt effectually reſiſts all putrefaction, which is much to be feared in fevers from the increaſed motion of the circulation. But among the ſoaps, the native are preferred, ſuch as honey, ſugar, the freſh expreſſed juices of ripe garden fruits, ſyrups, inſpiſſated juices and jellies, &c. prepared of theſe, and kept ready for ſale in the ſhops of confectioners. But decoctions of the bitter and moſt of the lacteſcent herbs are eſpecially recommended for this purpoſe, as they are enumerated in the *Materia Medica*, at the number correſponding to that of the preſent aphoriſm; and which are ſaid to be cooling, becauſe they never increaſe heat, even though they are endowed with a great diſſolving power, and are taken in large quantities. In all theſe plants there is a gentle bitterneſs, and upon wounding them they yield a milky juice of a mild, bitteriſh and aromatic taſte, which juice abounds with a diſſolving power, beyond almoſt every other known remedy, and has the advantage of exciting no diſturbance in the body during its action; and hence it is that theſe plants are uſeful both in acute and chronical diſeaſes. Thus the very malignant atrabiliary viſcid is never more ſafely nor more happily diſſolved than by a long continued uſe of theſe plants. At the ſame time there ſeems alſo to be a gentle anodyne power in theſe plants, but ſuch as is always ſafe and never offenſive, even though they are uſed in a greater quantity. All this may be more eſpecially affirmed of lettuce, which Galen [k] always eſteemed at a high rate, becauſe in his youth, when his ſtomach was continually infeſted with bile, he found relief from lettuce; and when he grew into years, lettuce was his only remedy againſt watchfulneſs, to compoſe him to ſleep. Of theſe plants, or in the winter-time of the roots of vipers-graſs, ſuccory, goats-beard, *&c.* which are uſually kept in the ſhops covered over with ſand, decoctions may be prepared, and uſed with great ſucceſs: but for theſe to exert their efficacy, it is neceſſary for them to be taken in large quantities, as no injury can be feared from taking them in ſuch a manner. About half a pound of theſe roots, for example, being beat in a mortar, boiled in two or three pints of water and ſtrongly expreſſed, gives a decoction, which being ſweetened with honey, ſyrups, *&c.* with the addition of a dram or two of nitre, affords a moſt efficacious remedy in this caſe.

But all theſe liquors ought to be drank hot, ſince by cold the particles of the blood concrete together, (ſee § 117.) and the veſſels are conſtringed ſo as to give birth to obſtructions (ſee § 108); or at leaſt ſo as to increaſe the preſent obſtruction.

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[k] Lib. II. de Alimentor. facult. cap. 40. Charter. Tom. VI. pag. 359.

Beſides this, the diſſolving power of water is increaſed by heat and leſſened by cold; for the brine of ſea-ſalt, for example, which is made as ſtrong as poſſible in the ſummer-time, cryſtallizes or depoſits ſome of its ſalts when the weather grows colder, and depoſits almoſt all its ſalt when it begins to freeze. But the heat in which theſe liquors are beſt drank, ſhould but little exceed that of the healthy body; for if it is increaſed beyond this, it may occaſion the blood and its ſerum to concrete or harden (ſee § 117).

## SECT. DCXV.

WHICH remedies (§ 613, 614.) that they may act well, quickly, ſafely, and powerfully, ought firſt to have blood-letting premiſed, becauſe that makes way for their entrance into the blood, and forwards their due mixture and action.

In what manner the too great force of a fever may be moderated by bleeding, we have already ſeen in the comment to § 610, and it was likewiſe demonſtrated at § 612, that by the ſame means the elaſtic force of the veſſels is beſt reſtored when they are weakened by too great a diſtention from the oppreſſing fluid. But alſo the efficacy of diluent and attenuating remedies is promoted by taking blood from a vein. For thus the thickeſt, namely the red part of the blood, is more eſpecially exhauſted from the body; and as every thing taken internally or applied externally, is received firſt by the veins only, therefore theſe being in ſome meaſure emptied by bleeding, will give an eaſier entrance to theſe remedies for them to mix with the blood. Beſides this, ſo long as the impervious viſcid matter continues impacted in the ſmalleſt extremities of the arteries, though the moſt powerfully diſſolving medicines are given in the largeſt quantity, yet they cannot reach to the affected part, but at moſt, can only paſs together with the humour urging behind, ſo as to touch gently the extremity of the obſtructing maſs, and can therefore exert little or no power towards diſſolving the ſame. But when by a copious bleeding in a full ſtream from a large orifice, the impulſe of the humours behind the obſtructing matter is leſſened, and the ſame matter repelled back by the contractile force of the arteries towards the larger capacity of the veſſel, or into larger branches, ſo as to flow with the reſt of the blood; then theſe diſſolvents mixing with the blood, and ground together as it were with the viſcid matter by the force of the veſſels, exert their powers with the greateſt efficacy. It is therefore evident, that blood-letting procures an eaſy entrance to theſe remedies, a ready mixture of them with the matter which ought to be attenuated and diſſolved by their power, and likewiſe that it renders their action ſafe and effectual.

## SECT. DCXVI.

WHEN once the viſcid matter is diſſolved by the fore-mentioned remedies, (§ 609 to 615.) it may be drove forward and expelled by a continuance, or a more plentiful uſe of the ſame: but frequently the matter being thus corrected will have no occaſion to be expelled (§ 95).

When the viſcid matter has been ſo diſſolved as to be able to flow through the veſſels together with the reſt of the humours by the uſe of the ſeveral remedies before-mentioned in the paragraphs cited in the preſent aphoriſm, then the phyſician ought to enquire whether the ſeveral functions return to their due integrity, and whether at the ſame time the whole force of the fever is allayed, or whether any new ſymptoms ariſe, becauſe the morbific matter, though diſſolved and rendered moveable by a due moderation of the fever and efficacy of remedies, as yet retains ſuch properties as render it repugnant to an equal circulation (ſee § 594, N°. 2); for then this matter ought to be expelled from the body to reſtore health. But it is not ſafe to attempt the diſcharge of it immediately by profuſe evacuations; but prudence directs to enquire by a diligent obſervation towards what part and by what paſſages nature inclines to evacuate the febrile matter from the bony, after it has been reſolved and rendered moveable; for when this is known, we then direct the diſſolved matter of the diſeaſe by lubricating the paſſages, and urging it forwards by gentle ſtimulants towards the part to which nature directs. Hence it is evident, that all the fore-mentioned remedies may be ſtill continued, and even the ſtrength and quantity of them increaſed to advantage, becauſe the obſtructions being now reſolved, the free motion of the humours through the veſſels is reſtored. At the ſame time alſo the action of all theſe remedies may be principally determined towards the affected part by warm bathing, fomentations, frictions, *&c.* applied to the part where we know by the ſigns before deſcribed (§ 594, N°. 2.) that nature endeavours to procure a diſcharge to the morbific matter.

Sometimes indeed the viſcid matter diſſolved by the forementioned remedies is ſo conditioned, that it is capable of being aſſimilated with the reſt of the healthy humours, and of circulating freely together with them through the veſſels without any impediment to the functions. In this caſe it is very apparent that there is not the leaſt neceſſity to expel what is diſſolved. As for example, if the red globules of the blood which are only capable of paſſing through the ſmalleſt extremities of the ſanguiferous arteries by one at a time, ſhould concrete together ſo as to ſtick faſt in them and occaſion diſeaſe; in that caſe a perfect cure may be obtained without any evacuation of the obſtructing matter, if by bleeding the impulſe of the humours urging behind is ſo much abated that the obſtructing particles are repelled back into the larger branches by the contraction of the veſſels; and afterwards the concreted globules may be reſolved into their ſmaller elements, by the conjunction of which they were made up, the diſſolution being effected by the attrition of the veſſels and the adjacent parts of the fluid with the diluents, attenuants, *&c.* See what has been ſaid upon this ſubject in the comment to § 595.

## SECT. DCXVII.

THE ſymptoms ariſing from a particular acute fever are chiefly the following; coldneſs, trembling, anxiety or oppreſſion, thirſt, ſickneſs at ſtomach, belchings, vomiting, weakneſs, heat, burning, drineſs of the ſkin and mouth, delirium, coma or ſleepineſs, over wakefulneſs, convulſions, ſweats, or diarrhæa, and inflammatory puſtules or eruptions.

We have already conſidered in order the three primary indications which are required for a general cure of fevers (ſee § 598.) It now follows therefore for us to treat of the cure of particular febrile ſymptoms. The ſymptom of a fever (as was obſerved at § 11 and 598.) is that preternatural change or appearance which happens in the body of the patient from the diſeaſe as the cauſe, yet ſo as to be diſtinguiſhable from the diſeaſe itſelf and its proximate cauſe. But it is thus denominated, as if it were a concomitant accident; becauſe, for any diſorder to be called a ſymptom of a diſeaſe, it ought to be preſent during the time of the diſeaſe, from whence it proceeds as an effect or conſequence. Thus for example, when a quartan terminates in a dropſy, the dropſy is not ſaid to be a ſymptom of the quartan, although it was an effect of it, becauſe it does not coincide with the quartan itſelf, but follows after it. For it was demonſtrated before (§ 593.) that fevers terminate in other diſeaſes; yet the diſeaſes in which the fever terminates cannot be reckoned among its ſymptoms.

Moreover, it is poſſible for a new diſeaſe to ariſe in the body at the ſame time when the fever is preſent, though it neither proceeds from the fever nor its proximate cauſe, but ariſes from a very different ſpring; as when, for example, a febrile patient is wounded or put into a violent paſſion, *&c.* All theſe are not called the ſymptoms of a fever, but ſupervening accidents (ἐπιγενόμενα [1]) becauſe they indeed aroſe during the time of the fever, but did not ariſe from thence as their cauſe. We are here therefore to treat only of the ſymptoms of fevers properly ſo called, of which the principal and moſt obvious are enumerated in this aphoriſm, and concerning each of which we ſhall ſpeak more at large hereafter, by conſidering each of them under a diſtinct head, in the order wherein they are here enumerated.

## SECT. DCXVIII.

ALL which ſymptoms (§ 617.) ariſing from the fever as their cauſe (§ 581, 587.) will conſequently ceaſe, when the fever is removed; and therefore if they can be ſupported ſo long without endangering the patient's life, they will hardly require a particular treatment.

Since therefore the ſymptoms of a fever properly ſo called acknowledge the fever for their cauſe, it is evident that the fever being cured they will be removed, and therefore they do not always require a particular treatment. The firſt enquiry muſt be then, whether the ſymptoms ariſing from the fever be ſuch as will give juſt reaſon to apprehend danger;

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[1] H. Boerh. Inſtit. § 801.

ger; for if they do not appear to be of ſuch a nature, they need not be regarded, and there will be no neceſſity to alter the general curative indication, which may be ſufficient to terminate the fever without making any new addition to it: ſince the ſame treatment which is able to cure the fever, will likewiſe ſuffice to conquer the ſymptoms. Thus the ſickneſs at ſtomach and vomitings, which accompany an ephemera or fever of one day's continuance, may be ſafely neglected; and yet the ſame ſymptoms in an acute continual fever often require a particular treatment, as will be made evident hereafter. It has been many times an obſtacle to the cure of the diſeaſe, becauſe the phyſician has immediately departed from his general indication, on account of the appearance of ſome new ſymptom; and that frequently when the ſymptom is ſlight, and generally goes off on its own accord. Hence Hippocrates juſtly obſerves, *Non ſecundum rationem levantibus fidere non oportet, neque valde timere mala præter rationem orta. Multa enim illorum incerta ſunt, neque multum perdurare, neque diutius morari conſueverunt.* "That we ought not to "truſt thoſe changes which relieve the diſeaſe "without any reaſon, nor yet to fear much the "ill accidents which ariſe without any cauſe or "reaſon: for many of them are uncertain, ſhort-"lived, and ſeldom have any long continu-"ance [m]."

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[m] Aphor. 27. Sect. II. Charter. Tom. IX. pag. 69.

SECT.

## S E C T. DCXIX.

BUT frequently theſe ſymptoms (§ 617.) ariſe from the vis vitæ, or effort of life, diſpoſing itſelf to a criſis, or to make a diſcharge of the critical matter; and when they precede, accompany or follow this criſis or excretion, they ought not to be diſturbed.

In treating of a criſis in the comment to § 587. it was made evident that wonderful diſturbances, or new and often violent ſymptoms were excited at the time, when the remaining health in the patient ſeems to encounter with the diſeaſe nearly with equal diſadvantage on both ſides. But even after the morbific matter has been ſubdued, and rendered moveable, ſo as to flow through the veſſels with the reſt of the humours, there are often raiſed anxieties, wandering pains, ſickneſs at ſtomach, tremblings, cold ſhiverings, *&c.* and very often the like ſymptoms accompany even the ſalutary evacuations of the ſame matter. But from all that has been hitherto ſaid concerning the cure of fevers, it is evident enough how badly the phyſician conſults the intereſt of his patients, who, being affrighted at theſe diſturbances and ſalutary efforts of nature, endeavours to allay them unſeaſonably by remedies. Therefore, before the cure of any febrile ſymptoms is attempted, it ought to be firſt carefully enquired, whether they are to be aſcribed to the diſeaſe itſelf increaſing, or to nature encountering the diſeaſe. For moſt of the ſymptoms, concerning which we are here to treat, are uſually obſerved either to precede, accompany, or even ſometimes to follow after the criſis, or an evacuation of the critical matter,

ter, and then they ought neither to be diſturbed nor removed; but when they ariſe from the increaſe of the diſeaſe, they often require a ſeparate treatment peculiar to themſelves.

But the critical ſymptoms are diſtinguiſhed from thoſe of the diſeaſe, from their appearing after a previous concoction of the crude morbific matter, and about the time proper for a criſis in ſuch diſeaſes; and it is alſo uſual for them to go off in a little time by a ſort of critical evacuation, or by a tranſlation of the matter upon ſome other part, and they are likewiſe accompanied with ſigns denoting that the vis vitæ overpowers the diſeaſe. But the morbid ſymptoms happen throughout any time of the diſeaſe, and more eſpecially during its increaſe; and they ariſe from the force of the diſeaſe overpowering the vital faculty, while there are manifeſtly all the ſigns of crudity ſtill attending; nor do they alleviate the diſeaſe, but are always injurious, by diſturbing many of the functions. But concerning the ſigns of concoction and crudity we treated before in the comment to § 587. It might be demonſtrated by many inſtances how much the ſame ſymptoms differ among themſelves, according to the different time of the diſeaſe in which they appear. Profuſe ſweats and great evacuations by ſtool are always of the moſt fatal conſequence in the beginning of acute diſeaſes, becauſe they exhauſt from the body the moſt fluid parts of the humours; and yet how frequently are acute diſeaſes happily cured by ſweats and diarrhæas, when they happen after a preceding concoction, and when the matter of the diſeaſe being ſubdued and rendered moveable is diſcharged by thoſe ways. In the firſt caſe theſe evacuations are to be reſtrained, but not at all in the laſt. A coldneſs of the extremities, when an ardent fever is in its increaſe or height, is commonly eſteemed a fatal ſign; and yet in the ſame diſeaſe when declining, a ſudden coldneſs often ariſes, and is attended with a violent ſhaking of the whole body, while the inflammatory lentor being diſſolved gives the blood a free paſſage through the ultimate extremities of the arteries into the veins, which terminates the diſeaſe. The weakneſs perceived in the beginning of acute diſeaſes is often removed by bleeding and other evacuations; but when the ſame ſymptom happens towards the end of theſe diſeaſes, it requires an oppoſite method of cure, namely, by filling with cordial nouriſhment. Theſe few inſtances may ſuffice to demonſtrate how much attention is here neceſſary to determine whether the ſymptoms appearing in fevers are of a good or bad preſage, and whether they ought to be removed by art, or left to nature.

## SECT. DCXX.

BUT if theſe ſymptoms (§ 617.) come out of ſeaſon, or are too violent or ſevere to be ſupported by the remaining life and patience in the ſick, or if they threaten to produce ſome more grievous malady, then each of them are to be mitigated by their reſpective remedies, having always a regard to the cauſes (§ 586.) and to the ſtage of the diſeaſe itſelf (§ 590.)

We come now to conſider what the ſigns are by which we know that the ſymptoms ariſing in fevers ought to be removed, and which denote that they cannot be ſafely neglected until they are cured together with the fever, from whence they derived their origin as the cauſe. The firſt of theſe is when they appear out of ſeaſon, that is to ſay, at a time of the diſeaſe when there have not yet appeared any ſigns of concoction, namely, in the increaſe of the diſeaſe: thus, for example, ſweats or a diarrhæa ought to be reſtrained, if they ariſe in the beginning of acute diſeaſes, as we obſerved before; not that theſe evacuations are always bad, but becauſe they are almoſt conſtantly injurious in that ſtage of the diſeaſe.

Too violent or ſevere to be ſupported by the vital ſtrength.] That is to ſay, when the ſymptoms denote ſuch a part of the body is affected as cannot ſuſtain much injury without endangering life; for then the ſymptom ought to be immediately relieved, although the original nature of the diſeaſe itſelf requires no ſuch procedure. That when a phrenzy ariſes in a continual fever, Sydenham [n] tells us that he indulged the uſe of blood-letting, clyſtering and cooling remedies more liberally than might otherwiſe ſeem to be ſafe. The vital ſtrength was often ſo much weakened by theſe means, as to occaſion the fever to run out to a longer extent, nor did the concoction and criſis of the febrile matter ſo happily ſucceed; but then the urgency of a ſymptom may require us to remove a greater evil by a leſs.

Or by the patience in the ſick.] How uſeful a quiet ſedate temper of mind is towards the cure of acute diſeaſes no one can be ignorant; and we have even ſeen before that a fever may be raiſed by violent paſſions of the mind only. If therefore the patient is of ſuch a diſpoſition, that a ſlight pain, anxiety, *&c.* puts him into a great fright, or if he ſhould be much enraged with anger, unleſs thoſe paſſions are immediately quieted, we are often obliged to alleviate, or even to remove ſome of the ſymptoms which might otherwiſe have been better neglected according to the rules of art. Of this the phyſicians are too ſenſible, who attend at the courts of the great. Thus I remember to have ſeen a moſt impatient youth, who ſo badly ſupported the hot fit in a regular or vernal tertian, that he perſiſted to have the ſymptom removed by opening a vein *ad deliquium*. When the phyſician and his friends ſtanding by, which laſt were alſo not unacquainted with phyſic, endeavoured to diſſuade him from it, he was ſo enraged that he ſnatched up a penknife, and opened a vein himſelf not without danger; nor could he be reſtrained without violence from continuing to bleed in this manner to the quantity of ſeveral pounds. Now although this fever would have been cured of itſelf ſpontaneouſly in a little time, and was under no neceſſity for having a vein opened, yet it might be allowed in ſuch a caſe to prevent the patient from hurting himſelf by ſuch a raſh attempt.

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[n] Sect. I. cap. 4. pag. 81.

Or if they threaten to produce ſome more grievous malady.] It is well known that ardent fevers are ſometimes very happily cured by a profuſe bleeding at the noſe ſupervening; and all prudent phyſicians never obſtruct ſuch an evacuation, unleſs it ſhould prove ſo large as to endanger the patient's life. But if an artery breaking in the lungs, by the force and violence of the fever, ſhould occaſion a ſpitting of blood, it muſt be immediately relieved by opening a vein; not on account of any danger from the hæmorrhage in itſelf, but becauſe there is danger, that if the ſpitting of blood be neglected, it cannot be afterwards ſuppreſſed; or leſt it ſhould degenerate into an ulcer of the lungs, and end in a conſumption, as ſometimes happens. Thus, for example, when the matter of the diſeaſe being diſſolved and rendered moveable, is tranſlated and depoſited on the legs, we then forward the depoſition on theſe parts by the application of cataplaſms, fomentations, *&c* but if the ſigns denote that the ſame matter tends towards the liver, lungs, brain, *&c.* we then endeavour to hinder it by all the aſſiſtance of art.

But in alleviating the ſymptoms of fevers, a regard muſt always be had to the cauſes from whence the fever itſelf aroſe; for unleſs this be attended to, the moſt fatal errors may be committed: Thus, for example, if the ſtagnating ſerum begins to putrefy in a dropſical patient, a fever enſues, which is often attended with intolerable thirſt: if now one endeavours to alleviate this troubleſome ſymptom by a frequent uſe of watery drinks and clyſters of the like nature, which always ſo happily allay febrile thirſt in other caſes (as will be declared more at large hereafter at § 640.) the patient would be much injured, and the ſtagnant water would be ſuddenly increaſed. When a delirium ariſes in fevers from exalted and corrupt bile lodged about the præcordia, as is frequently obſerved to happen, blood-letting though repeated is uſed without ſucceſs; but if the foul humour is removed by a gentle vomit, or carried off with a gentle purgative by ſtool, this ſymptom is removed, and the fever itſelf at the ſame time alleviated. They who attempt to cure a mania or madneſs by evacuation, which ſometimes happens in the beginning of ſtubborn intermittents, bring on an incurable fooliſhneſs upon the unhappy patient; and yet the ſame method ſucceeds very well in the other kinds of madneſs: whereas this kind of madneſs is happily cured by a reſtorative diet with corroborating cordial medicines, as Sydenham [o] very well obſerves. What has been ſaid might be proved by many more examples, but theſe may ſuffice;

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[o] Sect. I. cap. 5. pag. 123, 124.

from whence it evidently appears, that a regard ought always to be had to the cauſe of the fever itſelf in alleviating or removing the febrile ſymptoms.

But what a great difference there may be required in the cure of the ſame ſymptoms, according as they appear in the beginning, increaſe, height, or declenſion of the diſeaſe, we may ſufficiently demonſtrate by one example. When a phrenzy has been raiſed in an acute fever by the uſe of heating medicines, Sydenham[p] has obſerved, that bleeding and the uſe of clyſters have been ſerviceable, 'till the violence of the diſeaſe has begun to decline; and then he has often been able to ſubdue both the diſeaſe and this ſymptom by narcotic medicines, given in a little larger doſe than uſual. But the ſame medicine given in the beginning, increaſe or height of the fever, has been ſo far from doing good, that it has often turned every thing for the worſe; and therefore he obſerves, that in this fever, which uſually terminated in the ſpace of a fortnight, narcotics are never ſucceſsfully given before the twelfth day.

It is not therefore ſufficient, as ſome phyſicians imagine, immediately to attack the primary and moſt troubleſome ſymptom of the fever, without having any regard to the cauſe or the ſtage of the fever itſelf: for it is evident, from what has been ſaid before, that nothing ſafe or certain can be done in this reſpect, unleſs a diligent attendance be given to all theſe.

It now remains for us to deſcribe the manner of alleviating and removing theſe primary ſymptoms of fevers, each under their diſtinct and reſpective heads or titles.

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[p] Sect. I. cap. 4. pag. 81, 82.

## Of the cold Chill in Fevers.

### SECT. DCXXI.

COldneſs in the beginning of acute fevers ſuppoſes a leſs attrition in the parts of the humours againſt each other, and againſt the veſſels; a leſſening of their circulatory motion, and a ſtagnation of the blood and humours in the extremities of the body, the heart then contracting itſelf leſs powerfully, emptying itſelf leſs perfectly, and receiving leſs ſpirits flowing into it from the cerebellum.

Cold with reſpect to us is nothing more than the ſenſation which is perceived in us by a diminution of the heat in the body; and therefore cold with regard to us is not a poſitive being, but only a diminution of heat. But thermometers teach us, that all bodies retain the heat of the ambient air, if no cauſe is applied, collecting a greater quantity of fire in them. In the ſame manner, all bodies hotter than the ambient air, are obſerved to return to the ſame temperature with the air itſelf, as ſoon as the cauſe exciting heat in them ceaſes to act: but the heat of the healthy human body is always greater than that of the air in which we live; and therefore ſo ſoon as the cauſe exciting heat in us ceaſes or is diminiſhed, our heat leſſens in proportion, and comes nearer to the degree of heat in the ambient air; and this diminution of heat is accompanied with that ſenſation which we call cold.

Since therefore in the beginning of fevers there is almoſt conſtantly perceived the ſenſe of cold, it is evident that the cauſes generating heat in our body are at that time leſſened. But the attrition of the humours againſt each other and againſt the veſſels makes up the cauſe of heat in us; for this attrition being leſſened the heat is leſſened, and being increaſed the heat is alſo increaſed; but when it entirely ceaſes, as when a perſon dies, the dead body acquires or returns to the heat of the air itſelf in which it is contained. The truth of this doctrine will be demonſtrated by more proofs hereafter, when we come to treat of the febrile heat; and at preſent it may ſuffice to produce only a few arguments which prove this. By violent motion, or exerciſe of body only, the quickneſs of the circulation of our humours may be increaſed, and therefore the attrition of the humours againſt the veſſels becomes ſtronger and more frequent in a given time, and at the ſame time the heat is alſo increaſed, ſo that in the moſt ſevere winter's froſt an animal exerciſed with ſwift running for a conſiderable time may acquire a moſt intenſe heat. But in thoſe who have a leſs compact blood and more lax veſſels, there is always perceived a greater coldneſs, becauſe there is a weaker action of the veſſels on the humours. This coldneſs therefore denotes a leſs attrition of the parts of the humours againſt each other, and againſt the veſſels. But as this attrition depends on the circulating motion by which the humours are moved through the veſſels, it is evident enough that the circulatory motion is leſſened when this ſenſe of coldneſs is perceived.

But when the circulating motion of the humours is leſſened, the cauſes of that motion muſt be alſo diminiſhed of neceſſity, which are the action of the heart by which the blood is drove into the arteries and diſtends them, and then the reaction of the arteries, by which they contract their diameters while the heart is dilating, and by that means propel their contained blood through the extremities of the arteries into the veins. But when the efficacy of theſe two cauſes is diminiſhed, the motion of the humours cannot extend to the extreme parts of the body, becauſe they are moſt diſtant from the heart, which is the firſt cauſe of the motion in the humours; and then there are greater obſtacles to this motion here than in other parts from the ſmallneſs of the veſſels, which is ſtill more increaſed by the cold itſelf, which contracts all ſolid bodies. Hence the reaſon is evident why the humours ſtagnate in the extreme parts of the body by this febrile cold.

But when the reſiſtances about the extremities are increaſed, the humours there ſtagnating cannot overcome them by the moving powers, and therefore the heart will not be able to propel its contained blood into the arteries, becauſe they are hardly any longer pervious at their extremities, and are now very much diſtended in their larger trunks; therefore the heart will be leſs able to empty itſelf, and conſequently its contraction will be leſs, which in health entirely diſcharges all the blood contained in its cavities. Nor is it any objection to this that in a fever there is always a quicker contraction of the heart, (ſee § 573.) becauſe at that time it is much weaker, and not able entirely to empty its cavities of their contained blood, as was demonſtrated in the comment to § 576.

But as the heart is a muſcle, it requires the common cauſes of motion neceſſary in the other muſcles, namely an influx of the nervous ſpirits into the muſcular fibres of the heart, and of arterial blood into the veſſels which are diſtributed thro' its ſubſtance;

ſtance: and beſides theſe there is another peculiar cauſe exciting motion in the heart, namely an influx of the venal blood into its cavities; (ſee § 574.) and therefore one or more of theſe cauſes muſt be diminiſhed when the heart begins to contract itſelf with a leſs force in the beginning of the febrile cold; for although it may be eaſily conceived that the contraction of the heart muſt be leſſened when the febrile cold is already preſent, and when all the humours begin to ſtagnate about the extremities of the arteries, becauſe the force of the heart is not able to overcome the reſiſtances, and therefore is not able entirely to empty itſelf, yet it does not ſo evidently appear what the cauſe is which leſſens the heart's contraction at that inſtant of time when the febrile cold firſt begins to be perceived; for this cold ariſes from a leſs attrition of the parts of the humours betwixt each other, and againſt the ſides of the veſſels, and conſequently from a diminution of the circulatory motion, and therefore from a diminiſhed contraction of the heart, which ſeems to be the firſt cauſe of the circulatory motion: therefore this coldneſs, as an effect, ſuppoſes the pre-exiſtence of its cauſe. Bet the influx of the venal blood into the cavities of the heart will be rather increaſed by the febrile cold, contracting the external parts; and the blood being drove into the emptied coronary arteries, while the heart is in its contraction by that whole force with which the aorta contracts itſelf near the heart; therefore this cauſe of muſcular motion in the heart not being leſſened at that time, becauſe the moving powers are increaſed, and the reſiſtance in the empty coronary veſſels themſelves diminiſhed, nothing remains but that the influx of the nervous ſpirits from the cerebellum into the fibres of the heart muſt be leſſened at that time, from whatever cauſe that may proceed. We know indeed from the moſt certain obſervations, that the motion of the heart has been wonderfully altered, and ſometimes even totally aboliſhed, ſo as to cauſe a true ſyncope, when the motion of the ſpirits has been diſturbed only by a change of the thoughts in violent paſſions of the mind; and therefore it does not ſeem improbable that the ſame thing may happen in the beginning of the diſeaſe from the cauſe which excites the fever itſelf. However, it may be ſufficient for the phyſician to know the changes which happen in the body during the time of the febrile cold, even though the primary cauſe thereof does not as yet appear very intelligible.

From all that has been ſaid it is evident enough that this febrile cold is produced from the circulatory motion being leſſened; nor is there any occaſion for us to have recourſe to cold effervefcencies of the blood, or the mixture of ſalts, which produce a coldneſs while they are diſſolving in liquors; becauſe no ſuch ſalts can be demonſtrated preſent in the blood, nor no experiments can prove any ſuch effervefcence, mixture, *&c.* to take place during the time of the febrile chill.

Now all that is ſaid in the preſent aphoriſm holds true in the cold chill which accompanies the beginning of fevers; but when a coldneſs ariſes in an ardent fever, which is about to go off critically, the caſe is different, as we ſhall declare hereafter in the hiſtory of that fever; for then the impervious matter, which heſitated about the extremities of the arteries, being diſſolved, paſſes into the veins, whence ſoon after follows a very free courſe of the blood through the now pervious arteries into the almoſt empty veins: hence the attrition, which was before very great in the obſtructed veſſels, is ſuddenly diminiſhed, whereupon a ſalutary cold chill ariſes, even though the heart's contraction is not diminiſhed, and the humours do not ſtagnate at the extremities.

## S E C T. DCXXII.

IF this cold chill continues intenſe for a conſiderable time, it occaſions polypoſe concretions in the larger veſſels near the heart, but in the ſmaller veſſels it cauſes emptineſs, by forcing them to preſs out the fluid they contain; and from hence follow many and great miſchiefs both in the larger and ſmaller veſſels.

If therefore the febrile cold continues violent for a long time, the venal blood, by the contraction and tremor of the parts which attends cold, and by the ſhaking of the muſcles, will be derived towards the right ventricle of the heart: but the heart contracts and empties itſelf leſs at this time, as appeared under the preceding aphoriſm. Hence the venal blood will begin to be accumulated in the right auricle, venous ſinus and trunk of the cava; where being collected it will almoſt ſtagnate, while only a ſmall portion of this blood, and that the moſt fluid part of it, will be able to be tranſmitted through the lungs by the weak action of the heart; but from what was ſaid in the comment to § 152. N°. 2. it is evident, that ſuch is the nature of the blood even in healthy people, that it immediately begins to concrete by reſt, and ſeparates afterwards into two parts, the one of which being thicker and ſolid, ſwims in the other part which is thinner; but that the vital motion only ſo intermixes theſe parts together, as to retain them in the ſtate of fluidity.

When therefore in the febrile cold long continued, the blood begins to ſtagnate in the auricles, ſinus's, and large veſſels near the heart, the particles of the blood begin to unite together, and ſeparate from the thinner and ſerous parts, which are as yet able to paſs through the lungs, whence the reſt will be ſtill more inclined to concretion, ſo as to form polypous maſſes, which being once concreted, and rendered firm by long continuance at reſt, hardly ever after admit of being diſſolved, but produce the moſt troubleſome palpitations of the heart, with great oppreſſions or anxieties upon the leaſt increaſe of motion or exerciſe of body, with faintings, and other moſt troubleſome ſymptoms. But if the febrile cold is not of ſo long a duration, the fleecy and polypoſe concretions, which began to be formed in the blood, in the mean time being accumulated, more eſpecially about the right ventricle of the heart, are afterwards diſſolved and ground together by the febrile heat ſucceeding, with the increaſed force of the heart; and thus the parts which began to be concreted into a polypus may be diſſolved again, as was ſaid more at large in the comment to § 25. N°. 2. Hence the reaſon is evident why the lungs are found ſtuffed up with concreted and impervious blood in the dead bodies of thoſe who die in the cold fit of an intermitting fever, as we ſhall declare hereafter at § 749.

But ſince ſtrong powers of the heart are required to drive the blood through the ultimate extremities of the veſſels, it is evident, that theſe powers being leſſened, the circulation will become very difficult at that time through the ſmaller veſſels; and therefore only the moſt fluid part of the blood will be able to paſs through the lungs, while the reſt ſtagnates behind. But the ſmaller veſſels which receive the thinner, ſerous and lymphatic humours from the blood-veſſels, cannot be filled when theſe laſt are obſtructed; and becauſe the humours move more ſlowly in theſe ſmaller veſſels, as being furniſhed with weaker coats, and placed at a greater diſtance from the heart, thence a ſtagnation will follow. Moreover, theſe ſame ſmaller veſſels being contracted by cold, propel their contained humours into the veins; or if an obſtruction ſhould ariſe about the extremities of thoſe veſſels, they repel back their contained humour with a retrograde motion into the larger veſſels, while the force of the heart, being weakened in the mean time, urges them forward with little or no force behind: thus they will be emptied of their contained fluid; and if the ſides of the ſmaller veſſels remain thus collapſed for a conſiderable time, they may grow together ſo as to be never after pervious. But that there thus happens an emptineſs in the ſmaller veſſels, by expreſſing their contained humours, we are taught by thoſe diſorders which often accompany an intenſe febrile cold. For theſe patients are ſometimes ſo ſtiff that they are ſcarce able to bend any one joint; but we know that the due flexibility of the parts of the body depends upon a free motion of the humours through the ſmaller veſſels; for in new-born infants, who have all the veſſels yet pervious, we obſerve the greateſt flexibility and ſoftneſs of the whole body and its ſeveral parts; but in decrepid old age, the major part of the ſmaller veſſels being concreted and rendered impervious, we obſerve the greateſt ſtiffneſs and inflexibility. Beſides this, when the febrile cold is intenſe, and continued for a long time together, all thoſe functions languiſh entirely, which depend on a free motion of the thinneſt humours through the ſmalleſt veſſels: for theſe unhappy pa-

patients commonly lie ſtupid and dull, and are ſometimes known to be poſſeſſed with ſo great an inſenſibility as to burn their feet to the bones without any ſenſe of pain, during the ſeverity of the cold fit in a quartan.

If now theſe effects of the febrile cold are applied to ſeveral parts of the body, it is evident, that a great many of the functions may be thence diſturbed, and that therefore many and grievous diſorders are to be feared, partly from the concretion of the humours almoſt ſtagnant in the larger veſſels, and partly from the emptineſs of the ſmaller veſſels; and that from thence frequently ariſe diſorders afterwards incurable, if thoſe colds continue ſevere for any conſiderable time.

## SECT. DCXXIII.

HENCE it is evident what is denoted and preſaged by this coldneſs, and why the fever is more dangerous as the cold fit in the beginning of it was more ſevere; for in the beginning of a peſtilential fever, the cold fit is the moſt ſevere, and the heat is proportionably the greateſt as the diſeaſe advances.

What is denoted?] Namely, that the vital powers are diminiſhed, that the blood is accumulated, ſtagnant, and inclined to concretion in the vena cava, right venous ſinus and auricle, only the moſt liquid part being capable of paſſing thro' the lungs, while the groſſer parts heſitate in the narrow pulmonary arteries, whence little blood paſſes into the left ventricle of the heart, the power of whoſe contraction being leſſened, the blood is more difficultly propelled by it through the ſmalleſt extremities of the aorta, to which add all the other conſequences enumerated before at § 621.

What is preſaged?] If this coldneſs continues long, there is danger of the lungs being charged more and more with impervious blood, 'till at length all the courſe of the blood from the right ventricle of the heart through the lungs is intercepted, whence death follows after the moſt dreadful anguiſh. Moreover, all thoſe ill conſequences are to be feared, which were mentioned in the preceding aphoriſm. But when afterwards the blood is diſſolved, which heſitated almoſt impervious in the ſmall pulmonary arteries, it flows with a great velocity into the left ventricle of the heart, which being thereby irritated, contracts itſelf more powerfully; whence it drives the blood with a greater force through the aorta; hence the attrition of the humours againſt each other, and againſt the ſides of the veſſels, will be increaſed, and from thence follows heat. The blood then will now return thro' the veins to the right ventricle of the heart, with a ſwifter motion and a greater impetus, and will be more eaſily moved through the lungs now pervious; hence the circulation will become ſtronger, as the arterial blood will be more powerfully applied to the cerebellum, and will paſs more ſwiftly through the coronary arteries in the ſubſtance of the heart itſelf: And thus all the cauſes which excite the heart to motion, will be increaſed, namely, the influx of ſpirits into its muſcular fibres, and of blood into its veſſels and cavities: (ſee § 574.) and therefore, after the moſt intenſe febrile cold, will follow either ſuffocation and death, or moſt intenſe heat.

Why the fever is more dangerous as the cold fit, *&c.*] For this coldneſs denotes a diminution of the circulation, and therefore the greater the coldneſs the leſs the circulation; and the leſs the circulation, the nearer the diſeaſe approaches to death, wherein the circulation wholly ceaſes. But if at length the vital powers overcome this coldneſs, being irritated by the ſame cauſe which produced the fever, they render the circulatory motion ſo violent or ſwift, and excite ſo ſtrong a heat, that the worſt conſequences of every kind may be feared. For the very tender veſſels of the encephalon and lungs cannot bear ſo great a force without the greateſt danger; and the great heat following after the moſt intenſe cold, may diſſipate the more fluid parts of the humours, and inſpiſſate the reſt, whence there is the greateſt danger leſt the humours, becoming impervious, ſhould heſitate in the narrow extremities of the arteries, whence the worſt inflammation and gangrenes might be juſtly feared from ſo violent an impulſe of the humours urging behind the obſtructions in ſuch a fever. Moreover, we know from the intenſe cold in the beginning of acute fevers, that the febrile cauſe is very malignant, becauſe it is able ſo ſuddenly to weaken the vital powers in a healthy perſon. No wonder therefore that the moſt ſevere cold being obſerved in the beginning of a peſtilential fever, ſhould be afterwards followed with the moſt extreme heat in the progreſs of the diſeaſe; namely, when a fever is kindled by the peſtilential poiſon received into the body. For Sydenham [q] has obſerved, that ſometimes, in the beginning of a moſt fatal peſtilence, people would drop down dead ſuddenly in the ſtreets without any fever, red ſpots breaking out, as the meſſengers of preſent death. But when the plague is accompanied with a fever, we are aſſured, from the obſervations of phyſicians, that the patients have perceived the moſt intenſe cold, as if freezing water was poured over the whole body. But how great a degree of heat follows this coldneſs, is evident from many parts of the body being burnt up to a cruſt, where the violence of the diſeaſe ſettles, almoſt as if it had been produced by actual fire. We alſo obſerved, upon another occaſion (ſee the comment to § 85.), that the body of an infant dying of the plague continued hot even two days after.

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[q] Sect. II. cap. 2 pag. 133.

## SECT. DCXXIV.

THIS coldneſs being attacked by any kind of remedy, which is powerfully ſtimulating, under whatever denomination, has often occaſioned afterwards an incurable inflammation. Hence ſaline, acrid, aromatic and oily medicines, with bliſters, and the like, are here to be condemned as pernicious.

Since it is evident, from what was ſaid before, that during the time of the febrile cold the circulatory motion is diminiſhed; that the humours ſtagnate in the extremities, and that the force of the heart is ſo much weakened, that it leſs contracts and empties itſelf than it ought, therefore many have been of opinion, that it is neceſſary at that time to adminiſter cordials and other ſtimulating remedies, to accelerate the motion of the ſtagnant humours, and increaſe the powers of the heart. But during the time of the febrile cold, the venal blood ſtagnates, and is accumulated about the right ſide of the heart, while only its more fluid parts can be forced through the narrow arteries of the lungs, by the weaker action of the heart: If therefore the motion of the humours is increaſed at that time through the veſſels, by ſtimulating remedies, before the humours are attenuated, and the veſſels opened, the groſs and impervious parts of the blood will be more forcibly wedged into the extremities of the pulmonary artery, whence all the bad ſymptoms will be increaſed. Beſides this, when ſuch warm ſtimulating medicines have been exhibited, they continue to act even when the febrile heat comes on, after the cold fit has been overcome; and therefore they render the patient ſtill hotter, even while he is burning with the febrile heat itſelf; whence there may be danger of a moſt incurable inflammation afterwards. All ſuch remedies are therefore pernicious under whatever title they are adminiſtered, becauſe they urge the impervious humours towards the narrow extremities of the obſtructed veſſels during the febrile cold; and when the obſtructions are removed during the hot fit, they increaſe the quickneſs of the circulation, which is, of its own accord, about to acquire too great a velocity. I have known a fatal pleuriſy raiſed in a young man afflicted with a vernal tertian, by endeavouring to remove the cold fit by a very warm medicine, namely, by giving five drops of the burning oil of cloves ground well with ſugar, juſt before the approach of the fit.

## SECT. DCXXV.

BUT it is beſt cured by drinking warm water with a little wine, honey, and nitre; and alſo by warm bathing, a vaporous bath, fomenting and waſhing with a liquor of the ſame nature, to which add gentle frictions.

The beſt method of all for curing the febrile cold, conſiſts in ſo attenuating and diluting thoſe parts of the humours which heſitate and are impervious, that they may be able to paſs thro' the too narrow veſſels which are likewiſe relaxed by the ſame means ſo as to give them a paſſage; and when this is done, exciting the powers of the heart by a gentle ſtimulus can do no harm. Some diluent drink therefore made warm and mixed with honey and nitre, makes a capital remedy in this caſe: A little wine may be alſo added, or mild ſpices may be diluted in a great quantity of water; becauſe thus the water, in itſelf too unactive, is rendered more capable of penetrating, while at the ſame time there is no danger of injury from the ſmall quantity of ſo mild a ſtimulus, as is contained in ſo great a proportion of water. But all theſe drinks are to be taken in a ſmall quantity at a time and often, as every half quarter of an hour, leſt the ſudden diſtenſion of the ſtomach ſhould increaſe the anxiety or oppreſſion which already attends in the febrile cold, or leſt they ſhould be thrown up by vomit. But theſe drinks being received into the veins are conveyed immediately to the right ventricle of the heart, where by diluting and attenuating the ſtagnant blood, they render it more eaſily capable of paſſing through the lungs; and being afterwards more intimately mixed and moved together with the blood through the veſſels, they happily diſſolve and clear all obſtructions; ſo as to be always uſeful and never injurious. Various forms of theſe medicines are given us in the *Materia Medica* of our author at the number correſponding to that of the preſent aphoriſm; from hence may be choſe ſuch as ſeem moſt agreeable with the age and temperature of the patient, with the cauſe of the diſeaſe, *&c.* At the ſame time it will be very uſeful to apply liquid remedies of the ſame nature in the form of bath, vapour, fomentation, *&c.* to the bibulous veins opening in the ſurface of the ſkin; for theſe being abſorbed are likewiſe immediately conveyed to the right ventricle of the heart, where there is the greateſt danger of a concretion, as is evident from what was ſaid before.

While theſe are taking effect, the motion of the blood may be ſafely accelerated through the veſſels by gentle frictions, becauſe thus the humours being diſſolved by theſe diluent and attenuating liquors will find a more eaſy paſſage. But more eſpecially ſuch frictions are to be applied to the extreme parts of the body, becauſe there the cold is greateſt, and the more difficult paſſage of the humours through ſuch parts may be thus promoted. But when there is a great anxiety on account of the difficult paſſage of the blood from the right ventricle of the heart through the lungs, the greateſt relief may be had by applying ſponges dipped in hot water to the mouth, that by this means a ſort of vaporous bath may be applied to the ſurface of the lungs to relax the veſſels.

## SECT. DCCXXVI.

WHICH medicines (§ 625.) being directly applied, the greateſt injuries are often immediately cured (§ 622).

For all theſe remedies conduce to render the humours fluid and the veſſels pervious; and therefore the circulation will be rendered perfectly free. For ſince in the cold fit at the beginning of an acute fever, it does not yet appear what courſe the reſt of the diſeaſe will take, prudence directs to make no great alteration in the body, 'till it ſhall afterwards appear what is to be performed, and by what means. In the mean time that all theſe remedies are uſed, it often happens that the febrile cauſe which excited theſe diſturbances is expelled from the body, by diluting the blood and rendering the veſſels pervious; and thus often the greateſt diſorders are ſafely removed in their beginning, while in the mean time no manner of injury can be feared from the uſe of theſe remedies.

# Of Shaking in FEVERS.

## SECT. DCXXVII.

A Tremor or ſhaking ſuppoſes an inſtability or wavering of the muſcles, betwixt their tonic contraction and a relaxation, from the contracting and relaxing cauſes mutually ſucceeding each other involuntarily, and in ſhort inſtants of time; hence it ſuppoſes the arterial and nervous influx to be preſent at one inſtant, and abſent the next; and conſequently it denotes in the beginning of the diſeaſe a ſtagnation of both thoſe humours; and if it happens towards the end of the diſeaſe, it often denotes too great a want or abſence of thoſe fluids, after they have been ſubjected to too great a waſte.

All and every one of the muſcles which are moved by the influence of the will, may be contracted by the power of the mind, ſo as to move the parts to which they are affixed; and this new motion excited by the will is ſo ſwift, that there is no obſervable interval of time interpoſed between the cauſe and the effect: For I no ſooner will the extending of my finger, but it inſtantly becomes erect. But we may alſo with equal eaſe remove the motion which is thus raiſed, at our pleaſure; and then the part of the body will reſt, which was before moved through the influence of the will by the muſcles, whereupon it falls down by its own weight, or the ambient parts by their elaſticity recover their former ſituations, which they loſt by the preceding force of the muſcles. If now we conceive a muſcle to be diſtended by the will, ſoon after relaxed, then again diſtended, and thus reciprocally by a ſudden acceſſion and receſſion of the moving cauſes, we ſhall then have an idea of trembling or ſhaking; for we may thus be able at pleaſure to cauſe a trembling thro' the whole body, or ſome particular part, by a voluntary motion of the muſcles. It is therefore evident that in trembling there is a ſort of inſtability or wavering of the muſcles, betwixt contraction and relaxation.

But ſometimes theſe cauſes contracting and relaxing the muſcles are obſerved to ſucceed each other againſt the will, and then it is a morbid trembling, becauſe it does not proceed from the deſire, but againſt the inclination of the perſon, who is not able to reſtrain it by the influence of his will. A palſy therefore differs from a trembling, becauſe in the laſt the contraction of the muſcle is renewed; and it differs from a cramp or tetanus, becauſe the contraction of the muſcle is ſoon after followed with a relaxation.

But there is a twofold tremor obſervable, one wherein the limbs are agitated with a motion ceaſing and renewed again alternately againſt the will, while the perſon is at reſt and in his bed, and which cannot be ſuppreſſed by his will: But another kind of trembling ariſes only when he deſigns to move the whole body or ſome of its parts. In the firſt caſe a trembling ſeems to ariſe from ſuch an alternate irritation in the common ſenſory, from any cauſe as excites the powers moving the muſcles to act ſuddenly, then to ceaſe, and then again to be renewed. But in the latter caſe there ſeems to be a deficiency of that moſt ſubtle fluid, by the impulſe of which, determined by the influence of the will, the muſcles are contracted; in which caſe the muſcles are indeed moved by the will, but are not ſupplied with a quantity of ſpirits ſufficient to keep them contracted with an equal force. For we know from phyſiology that a voluntary contraction of the muſcles, requires a free commerce betwixt them and the brain by the nerves, and that if this communication is removed by a ligature, compreſſion or deſtruction of the nerve, the ſtrongeſt efforts of the will cannot be able to excite any motion in the muſcles; but it is likewiſe evident, that the moſt ſubtle fluid ſeparated from the arterial blood, by the fabric of the encephalon is diſtributed from thence by the nerves, and that by the means of this, muſcular motion is excited. When therefore the quantity of this fluid is deficient, the action of the muſcles muſt be inſtable and weak. Thus we ſee even in the ſtrongeſt men, that they tremble by endeavouring to lift a weight beyond their ſtrength, becauſe that which is to be moved exceeds the moving powers. It is no wonder therefore if tremblings ariſe fro this cauſe in people weakened by too great evacuations, or violent diſeaſes preceding, when they endeavour to move the body. But concerning this it ought to be obſerved, that while we are in health many muſcles act which ſeem to be at reſt. Thus when we ſit upright, the head and trunk of the body are retained in that poſture by the action of the muſcles; and therefore when theſe muſcles are flaccid at the approach of ſleep, the head nods forward, and the trunk of the body unleſs ſupported inclines to one ſide or the other by its own weight. Even when we lie in bed the muſcles by their action direct the poſture of the body, on which account Hippocrates in his Prognoſtics ſo much condemns a collapſion of the body by its own weight in ſick patients; for it denotes an entire loſs of ſtrength. Hence it is evident that a trembling may ariſe in the weakeſt people, though they may ſeem to lie down and be at reſt, and that this ariſes only from the deficiency of the moſt ſubtle fluid, and not from any cauſe irritating the common ſenſory.

Theſe two kinds of trembling are very minutely diſtinguiſhed by Galen[q], who has likewiſe given them different names. *Tremor enim* (τρόμος) *facultatis corpus moventis & vehentis infirmitate oboritur. Quippe nemo, qui artus movere non inſtituerit, tremet. Palpitantes autem partes, etiamſi in quiete fuerint, etiamſi nullum illis motum induxeris, palpitant.* "For a trembling (ſays he) ariſes from "a weakneſs of the faculty which moves and "carries the body. For no body trembles who "does not endeavour to move his limbs. But "palpitating parts although at reſt, will palpitate "although you introduce no motion in them." He therefore calls the firſt kind of trembling before deſcribed, by the name of palpitation, namely, when the limbs of a perſon at reſt are agitated with an alternate motion contrary to his inclination; but the latter, which happens only when a perſon endeavours to move ſome part, he calls trembling.

In both caſes the trembling ſeems to enſue becauſe the moving powers are at one inſtant applied to the muſcles, and ceaſe the next, then renewed again, and afterwards ceaſing. But that a flux of the nervous and arterial fluids into the muſcles is the cauſe of their motion, was demonſtrated at large in our author's phyſiological lectures or inſtitutes;

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[q] De Tremore cap. 3 & 4. Charter. Tom. VII. p. 200, 201.

and therefore this influx muſt be inſtable, ſometimes preſent and ſometimes abſent, to cauſe a trembling. In the beginning therefore of diſeaſes, when the body has not been exhauſted by large evacuations, nor the powers weakened by a long continuance of diſeaſe, we cannot accuſe the deficiency of either of theſe fluids; but the only fault then ſeems to conſiſt in the imperviouſneſs of the humours obſtructing the free circulation through the ſmalleſt veſſels; or at leaſt the courſe of the humours is not ſo free as is required for muſcular motion, which follows in an inſtant of time by the influence of the will. But towards the end of diſeaſes, a trembling often ariſes rather from a deficiency of either of thoſe fluids than from their being impervious. For ſince the conjunct actions of all the veſſels and viſcera ought to conſpire to the formation of the moſt ſubtle fluid called the ſpirits of the nerves, it is no wonder if many of the functions being injured by diſeaſe, ſhould occaſion a deficiency in the laſt elaboration of this fluid. Add to this, that very often many evacuations ariſe during the time of the diſeaſe, either ſpontaneouſly or procured by art; and at the ſame time thoſe functions are either abſent or languiſhing, by which the loſt ſubſtance both of the ſolids and fluids ought to be ſupplied. Hence it is ſufficiently apparent, that a different method of cure is neceſſary according to the difference of the cauſe.

But although we treat here only of a febrile trembling, yet it may not be inconvenient to add ſomething concerning trembling, ariſing from other cauſes. For although an influx of the nervous and arterial fluid is neceſſary to the action of a muſcle, yet there is alſo another determining cauſe required to make the fluid be conveyed in a greater quantity and velocity through the nerves into one or more of the muſcles. This we know is performed by the influence of the will in the voluntary muſcles, for which purpoſe a ſound ſtate of the brain is neceſſary: for when the brain is compreſſed by blood extravaſated within the cranium, the perſon falls down apoplectic, and all the actions of the voluntary muſcles ceaſe. But the fabric of the cerebellum ſeems to have the ſame uſe, with reſpect to the muſcles which are ſubſervient to the vital motions exerciſed without the influence of the will, that the brain has with reſpect to the muſcles ſubſervient to the will. If therefore there is concealed in that firſt origin of the nerves called the common ſenſory, ſuch a diſpoſition as will excite an alternate influx into ſome nerves which lead to one or more muſcles, a trembling may follow almoſt in the ſame manner as if it was performed by the influence of the mind (for we may by the will excite a trembling either throughout the whole body or ſome particular part) even though the nervous and arterial fluid abound in a great quantity, are both of them eaſily pervious, and all the veſſels open. Nor need it ſeem ſo wonderful that this ſhould happen, even though no ſenſible cauſe at all can be found throughout the whole body to produce it, only ſome change in the common ſenſory, of whatever kind it may be, manifeſting itſelf merely by this effect; for we experience the ſame thing in the uſual motion of the muſcles, which although ſo ſenſible and capable of altering the ſeveral parts of the body with ſo great a force, does yet hardly ſeem to be corporeal in its origin, ſince during their action there is no apparent cauſe thereof, and when the motion is ſuppreſſed by the will which they excited, there no longer remains any ſign or footſtep thereof. But that trembling may ariſe from ſuch a latent diſpoſition in that part of the body, by which the motions of the muſcles are excited and directed, ſeems to be taught us by practical obſervations. I have myſelf ſeen in the city of Leyden a man of a full age, who in his ſleep would be rouſed up as it were by a dreadful noiſe of thunder, while in the mean time he imagined the whole houſe to be ſet on fire with lightning; after which he uſed to fall into ſuch a trembling of the whole body, that not one muſcle ſubject to the influence of the will was free from the concuſſion. In this condition he lived twenty years, healthy in other reſpects, but always ſitting at his door he afforded a moving ſpectacle to all who paſſed by, every part of his body being ſhook with ſuch violent tremors that he appeared red or fluſhed, hot, and would frequently run down with ſweat even in the midſt of winter: while he ſlept the trembling ceaſed or elſe much abated, but it returned again as ſoon as he waked. Tulpius [r] obſerved a wonderful periodical trembling in a pale faced virgin plainly of a phlegmatic habit, which continued for three whole days, firſt invading all the limbs, and then terminating only in the arms and legs; nor yet was this trembling conſtantly preſent, but only at certain intervals, continuing near two hours each time, with a hoarſeneſs and ſuppreſſion of the voice. It is well known that tremors are frequently raiſed only by violent paſſions of the mind, and that when they have once ſuffered ſuch a trembling it eaſily returns, even from a ſlight cauſe. Thus I ſaw a healthy virgin who, though poſſeſſed of a pretty ſtrong body daily exerciſed with labour, fell into a very bad trembling of the whole body by a ſudden fright, and which afterwards would return upon very ſlight occaſions, although ſhe had long perſiſted in-

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[r] Lib. I. cap. 12. pag. 30.

in the uſe of nervous, corroborating, and hyſteric medicines. Many more practical inſtances might be alledged to confirm the ſame thing; but from thoſe here mentioned I believe it is ſufficiently evident, that a violent, laſting, and often incurable trembling may ariſe only from a change in the corporeal organ, upon which the exerciſe and direction of the muſcular motion depends, even tho' nothing can be found amiſs in any other part of the body.

## SECT. DCXXVIII.

IF ſuch a ſhaking continues long it occaſions an impediment to the circulation of the humours, and the ſeveral ill conſequences thence proceeding.

Every muſcle, when it acts ſwells, turns hard, and pale, and the turgid muſcular fibres compreſs with a great force the intervals and blood-veſſels which are interſperſed betwixt them. Hence the veins diſperſed through the ſubſtance of the muſcles are emptied, but the arteries being compreſſed repel the thicker part of the red blood and tranſmit only the moſt ſubtle part, as may be ſeen more at large in the theoretical lectures or inſtitutes of our celebrated author, § 406 [s]. But at the ſame time alſo the adjacent veins being compreſſed by the action of the muſcles, accelerate the return of the venal blood. But ſoon after, when the muſcles are relaxed, the contrary takes place; for then the muſcles look red and are filled with blood. It is therefore evident, that if a trembling continues long it may diſturb the free circulation of the humours through the ſubſtance of the muſcles and adjacent parts, from whence many diſorders may ariſe. Add to this, that a violent and long continued trembling is followed with a very great wearineſs; a remarkable inſtance of which I ſaw in a virgin afflicted with a quartan, and poſſeſſed of a very moveable or tender nervous ſyſtem: for ſhe was ſo violently ſhook for three or four hours at every fit of the quartan, that ſhe lay miſerably tired on the intermediate days, and could hardly recover ſtrength enough in the mean time to ſuſtain the following paroxyſm. But how much uſe will contribute to ſuſtain an inveterate malady with more eaſe, is evident from the inſtance of the man before-mentioned. (§ 627) who was able to ſupport this troubleſome diſorder for the ſpace of twenty years.

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[s] Herm. Boërhaave Inſtitut. Medic. § 406.

## SECT. DCXXIX.

FROM hence may be derived the diagnoſis and prognoſis of this ſymptom; and from thence it likewiſe appears, why trembling and cold accompany each other (§ 621)? Why a ſevere trembling is ſo bad? Why trembling accompanies violent paſſions of the mind, and why it attends towards death? Why it follows from too profuſe evacuations of all kinds? And why from drinking too much of any kind of liquor?

Diagnoſis.] It is eaſy to diſtinguiſh whether a trembling is preſent, ſince it appears to the ſenſes: and it is likewiſe poſſible to diſcover the cauſe from whence the tremor ariſes, namely, whether it be from too great a fulneſs, as in plethoric people, who frequently tremble, or whether it be from an imperviouſneſs, a reſt, or a deficiency of the humours,

mours, as often happens after great evacuations in the end of diſeaſes. For a plethora is known by its ſigns, enumerated before at § 126, at the letter ε; an imperviouſneſs of the vital fluid is known to be preſent when the ſigns denote the actions of the lungs and encephalon to be injured, becauſe a regularity of the actions depending on theſe viſcera, requires a free courſe of the vital fluids through the ſmalleſt veſſels; but a reſt, or a too ſlow motion of the humours, diſcovers itſelf from a weak and ſlow pulſe, and a weakneſs in the whole body: but that a deficiency of the humours offends, we know from profuſe evacuations preceding, and from a collapſion of the veſſels, with weakneſs.

The prognoſis teaches us, that from a violent and long continued trembling, the ſame bad conſequences are to be feared, concerning which we treated before at § 628. Moreover the prognoſis determines whether the cure of the trembling will be eaſy or difficult, ſpeedily or ſlowly obtained, chiefly with regard to the diverſity of the cauſe which excited the trembling; for if it derived its origin from too great fulneſs, it will eaſily be cured by bleeding and other evacuations; if from an imperviouſneſs of the vital fluids, it is commonly more difficultly and ſlowly cured; if from a deficiency of them after great evacuations, it indeed admits of a cure, if the body is not ſo far weakened but it is able to form good juices from the ingeſted aliments; but yet ſo much time will be taken up in the cure, as is neceſſary to reſtore the juices which have been waſted. But when the trembling ariſes from a violent commotion of the mind changing the common ſenſory, which change remains fixed, and does not go off when the paſſions are quieted, the cure then appears to be difficult, and frequently altogether impracticable.

Why trembling and cold attend together? ] For during the febrile cold (ſee § 576.) the pulſe is ſmall and often intermitting, and the paleneſs, &c. denote that the blood ſtagnates in the extremities of the veſſels; whence the motion of the arterial fluid is inſtable and diſturbed, one moment being almoſt at a ſtop, and the next ariſing to a conſiderable pitch. But the ſecretion of the ſpirits and the motion of them through the nerves, requires a free circulation of the arterial blood through the veſſels of the encephalon; whence 'tis evident, that in the cold fit the equable motion of the ſpirits is diſturbed thro' the nerves. The two cauſes therefore of muſcular motion will be thus wavering or inſtable, namely the influx of the arterial blood, and of the nervous fluid into the muſcles: whence it is evident, agreeable to what was ſaid before at § 627. that the reaſon is eaſily aſſigned why a trembling accompanies the febrile cold.

Why a ſevere trembling is ſo bad?] Becauſe it denotes that both the nervous and arterial fluid are either deficient or impervious; and at the ſame time ſuch a violent trembling ariſing in the beginning of a fever, denotes much ſtrength of the cauſe which is capable of exciting ſo great a diſturbance, in a body which has been hitherto healthy. And likewiſe, becauſe a great trembling ſuppoſes obſtacles oppoſing the circulation of the humours, therefore many bad conſequences are juſtly to be feared from thence. Moreover, tremblings which ariſe in the courſe of acute fevers or other diſeaſes, unleſs they precede or accompany critical evacuations, are often of the very worſt import; becauſe they generally denote, that the matter of the diſeaſe inclines to the head, and there diſturbs the equable motion of the nervous fluid in the origin itſelf of all the nerves, that is in the medullary ſubſtance of the encephalon. Hence Hippocrates[t] ſays, *In vehementer Phreneticis tremores lethales.* "That "tremblings in highly phrenetic patients are fa- "tal." Alſo[u], *Quibus ab atra bile mente motis tremores fiunt, malum.* "That tremblings are bad "in thoſe who are indiſpoſed in mind from an "atrabiliary humour." And in another place[w], *Palpitantes per totum, an voce capti intereunt:* "That thoſe who are taken with palpitations or "tremblings throughout the whole body, or loſe "their ſpeech, periſh." An inſtance of which laſt aſſertion he gives us in the hiſtory of his fourth patient in the third book of his Epidemics[x], who being phrenetic loſt his voice on the ſecond day in the morning, and had palpitations throughout the whole body; but on the fourth day he periſhed. Many more inſtances of the like kind might be alledged from Hippocrates; but theſe may ſuffice to prove what an ill omen trembling often affords in diſeaſes.

Why trembling accompanies violent paſſions of the mind?] That the whole common ſenſory is capable of being diſturbed by violent paſſions of the mind, no one doubts; and many inſtances have been mentioned in proof of this in the comment to § 104: it is therefore no wonder if a trembling and irregular influx of the nervous ſpirits into the muſcles ſhould from thence proceed. But although people who are poſſeſſed with the moſt intenſe anger, or the greateſt joy, often tremble throughout their whole body, yet a trembling follows more eſpecially from great fear beyond any other affections of the mind; and therefore fear is often repreſented by authors under the word trembling.

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[t] Coac. Prænot. N°. 99. Charter. Tom. VIII. pag. 857.
[u] Ibid. N°. 95. & Prorrhetic. Lib. I. N°. 14. Charter. Tom. VIII. pag. 710.
[w] Coac. Prænot. N°. 347. Charter. Tom. VIII. pag. 871. Prorrhetic. Lib. I. N°. 29. ibid. pag. 718.
[x] Charter. Tom. IX. pag. 298.

bling. Thus we read in the poets, who exactly repreſent nature, that men ſtruck with fear tremble. Dolon being ſent as a ſpy from Hector, and taken by Diomedes[y], ſtuttered; his teeth ſhook and claſhed together, and all his limbs trembled. We obſerved before in the comment to § 627. that an incurable trembling aroſe only from a fright, and continued for the ſpace of twenty years. It is therefore evident, that ſuch a diſturbance may ariſe in the common ſenſory from violent paſſions of the mind, and that the motion of the ſpirits being diſturbed, even from ſlight cauſes, may occaſion a violent trembling, even though the body be perfectly healthy in other reſpects.

And why it attends towards death?] It was ſaid before in the comment to § 627. that a trembling ſuppoſes the influx of the nervous and arterial fluid to be ſometimes preſent and ſometimes abſent: but the uncertainty or wavering ſtate of the pulſe, intermitting towards the approach of death, demonſtrates that the blood is ſcarce any longer able to paſs through the lungs from the right to the left ventricle of the heart; and therefore the heart is not contracted ſtrongly, but trembles and palpitates with a ſwift motion, 'till after a few minutes ſo great a quantity of blood comes into the left ventricle, that being thence irritated it contracts more powerfully, and drives the contained blood into the arteries with a greater force: hence at that time there will be a greater influx of the arterial blood into the muſcles, and a ſtronger impulſe thereof to the encephalon, whence the motion of the ſpirits through the nerves will be increaſed: but ſoon after, all theſe effects ceaſe, 'till the heart being at length filled again, is excited to renew its contraction. It is therefore evident, that towards death the influx of the nervous and arterial fluid is preſent one moment and abſent the next, whence a trembling enſues. Hence Hippocrates ſays [z], *In pernicioſe jam habentibus parvi tremores* (τὰ σμικρὰ τρομώδεα) *& æruginoſi vomitus, lethales.* "That ſlight tremblings and vomiting "of green matter are mortal ſigns in thoſe who "are dangerouſly ill."

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[y] Homer. Illiad. Lib. X. ver. 188, 189.

Why it follows from too profuſe evacuations of all kinds?] To continue an equable circulation of the humours it is neceſſary for the veſſels and more eſpecially the arteries to be full: for there are two cauſes by which the blood is moved through the veſſels, as appears from phyſiology; namely, the force of the heart expelling the blood into the arteries and dilating them; and then the contraction of the diſtended arteries themſelves, urging forward the blood while the contraction of the heart ceaſes and is filling again. But unleſs the arteries are firſt diſtended, they do not contract themſelves; nor can the heart diſtend the arteries, unleſs they are full at the ſame time when the heart propel its contained blood into them. For if the arteries are empty or ſo little filled, that in the leaſt diameter of their contraction, their ſides do not come into contact in every point with the ſurface of their contained fluid, it is very evident that the blood expelled from the heart may enter the arteries without dilating them; and therefore no contraction of the arteries will follow. But ſince the larger arteries are ſtrong elaſtic canals, they will not collapſe even though there is a deficiency of their diſtending fluid, but they will remain in the ſmalleſt diameter of their contraction; and therefore if there ſhould be ſo great a loſs of the fluids that the arteries are not full enough in this their greateſt contraction, it is evidently impoſſible for the ſyſtole of the arteries to

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[z] Coac. Prænot. N°. 64. Charter. Tom. VIII. pag. 856.

to act upon their contained humours, and therefore death or a reſt of them all will follow. But when a profuſe evacuation has only conſumed ſuch a quantity of the humours that the arteries ſtill continue to be diſtended in ſome meaſure by the blood expelled from the heart, though with a weak force, the circulation will not altogether ceaſe, but become languid and unequal; and therefore for the reaſons before-mentioned the arterial and nervous influx into the muſcles will be wavering and unſtable, whence a trembling will follow. Thus we ſee in the killing of animals, that when a great quantity of blood has been evacuated, a trembling follows. After profuſe diarrhæas, cholera morbus, and other ſuch ſudden and profuſe evacuations, tremblings enſue, as we are taught by daily obſervation.

Why from drinking too much of any kind of liquor?] When liquors are daily taken into the body in a great quantity, the maſs of humours to be tranſmitted through the veſſels is increaſed; whence a greater diſtenſion of the veſſels will enſue, beyond what they were uſually ſubject to: but too great a diſtenſion, eſpecially when often repeated, is followed with a morbid weakneſs in the fibres, as was ſaid before in the comment to § 25. N°. 3. and hence the veſſels may indeed be more eaſily dilated, but then they will re-act with a leſs force upon the diſtending fluid; and yet it is upon this re-action of them that the motion of the humours through the veſſels is in part carried on, as we ſaid before. Beſides this, when the liquors drank have been diſcharged from the body by urine, ſweat, &c. the fibres before diſtended and weakened do not contract themſelves with a ſufficient ſtrength towards their axis, ſo as to propel their contained fluid equally in all directions; and hence the ſame conſequences will follow as thoſe before-mentioned from too profuſe evacuations. Hence the reaſon is evident why thoſe who are daily accuſtomed to the abuſe of warm watery liquors, by drinking them in great quantities, are afterwards ſo frequently puniſhed with a trembling of the limbs; which diſorders are ſtill more increaſed, becauſe the fluidity of the blood from theſe watery drinks being augmented, all the veſſels and viſcera are more weakened; (ſee § 43. N°. 3.) and therefore the ultimate elaboration of the moſt ſubtle fluid, namely the nervous ſpirits, will be leſs happily performed; but the moſt troubleſome trembling of all frequently follows from the abuſe of wine or fermented ſpirits, for there is a much greater diſtenſion of all the veſſels obſerved from theſe than from watery drinks: and hence ſuch unhappy people are obſerved to be altogether trembling and incapable of the ſeveral offices of life, unleſs their veins are conſtantly kept diſtended with wine; and thus they are obliged to have recourſe to the ſame liquors again, even againſt their inclination, and even in oppoſition to their better knowledge and approbation. See more concerning theſe liquors in the comment to § 605. N°. 11.

## S E C T. DCXXX.

SUCH a trembling is cured by reſtoring the equable flux and preſſure of the arterial fluid through the arteries, and of the nervous fluid from the brain and cerebellum into the moving fibres: and this is to be done in the beginning of the diſeaſe by ſuch things as diſſolve the febrile lentor, and recover the ſtrength; (§ 606, to 617.) but towards the end of the diſeaſe it is relieved by ſuch things as ſpeedily reſtore the loſt humours, and ſtrengthen the fibres and viſcera. (See § 46, to 50.)

It appears from phyſiology *, that a free courſe of the ſpirits is neceſſary from the encephalon, flowing through the nerves into the moving fibres, to perform the action of the muſcles; and alſo at the ſame time for the blood to be freely diſtributed by the artery throughout the whole ſubſtance of the muſcle: but whatever impedes this influx, either by injuring the encephalon, medulla ſpinalis or nerves thence ariſing, deſtroys the motion of the muſcles; but alſo the ſame is likewiſe true of the arteries tending to the muſcles. So ſoon therefore as a due quantity of both theſe fluids are ſent to a muſcle, while both the veſſels and fluids are pervious, theſe motions are excited in all the voluntary muſcles by the leaſt influence of the will, as we find ourſelves able to perform them with eaſe, pleaſure, and a certain conſtancy during health: trembling will therefore be cured by this means, as it

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* H. Boërh. Inſtitut. Medic. § 401.

it conſiſts in a wavering or inſtable diſpoſition of the muſcles betwixt contraction and relaxation; (ſee § 627.) and therefore it ſuppoſes an incapacity in the muſcles conſtantly to perform their motion; but when this equable and nervous influx of the arterial fluid cannot be reſtored, the trembling remains incurable, as it is obſerved ſometimes; for example, when ſuch a change has been made in the corporeal organ (by which the mind as long as it is united to the body determines the motion of the ſpirits into all and every one of the muſcles) that thence the equable influx of the ſpirits into the muſcles is diſturbed in its determination by this its firſt ſpring or corporeal origin.

But in a febrile trembling one ought carefully to diſtinguiſh whether it be obſervable in the beginning or towards the end of the diſeaſe. For in the beginning the fever cannot yet be accuſed of waſting too much the vital fluids, unleſs very profuſe evacuations have been made in the beginning of the fever, which may be eaſily known: but at this time of the fever the trembling uſually ariſes from a lentor, by which name we underſtand every obſtacle impeding the free motion of the humours through the extremities of the ſmall veſſels where the impediment is formed, whether from a fault of the veſſels or humours, or of both together; and therefore the removal of this lentor will likewiſe cure the trembling. But in what manner this lentor ought to be removed, and what different remedies are required for this purpoſe, has been ſufficiently declared at large under the aphoriſms above cited. But every thing which removes the lentor likewiſe reſtores the ſtrength, becauſe the weakneſs in the beginning of the fever proceeds from obſtruction, and not from inanition. But towards the end of the diſeaſe the lentor being diſſolved by proper remedies, and a due moderation of the fever itſelf, the trembling that attends requires a very different method of cure. For then it ariſes either from a deficiency of the nervous and arterial fluids, or from a too weak motion of the humours thro' the veſſels. The indication therefore calls for a reſtitution of what is loſt with the greateſt expedition, or elſe for an increaſe of their too weak motion. The firſt is performed by taking in ſuch nouriſhment often and in ſmall quantities, as may be digeſted by the functions of the body now weakened by the diſeaſe, and ſo as to be eaſily converted into healthy humours: but concerning theſe ſee what has been ſaid in the comment to § 28. But too weak a motion of the humours is to be increaſed chiefly by ſtrengthening the veſſels and viſcera: for during the violence of the fever all the veſſels were too much diſtended by the humours overheated and rarefied by their too great motion; but after the fever is abated, the body exhauſted of its beſt juices grows languid, the veſſels collapſe, and are weakened by the too great diſtenſion preceding, whence it is neceſſary to ſtrengthen them; but by what means they may be thus ſtrengthened has been alſo explained under the aphoriſm cited in the text. But here more eſpecially frictions and exerciſes of the body are of the greateſt uſe, becauſe by theſe means the veſſels and viſcera are happily ſtrengthened, and the celerity of the motion of the humours may be thus increaſed at pleaſure, without ted uſe of any ſtimulating remedies. But by increaſing the ſtrength of the veſſels and viſcera, the ingeſted aliments are ſooner and better changed into our own nature, and therefore by the ſame remedies a ſpeedy reſtitution will be made of the loſt humours.

From what has been ſaid it is evident, that the method which is beſt to cure a febrile trembling in the beginning of the diſeaſe, is altogether pernicious when applied in the end of the diſeaſe, and the reverſe: this will appear more evident by example. When in an acute inflammatory fever the lentor renders the circulation of the blood difficult and unequal through the veſſels of the encephalon, all the functions of that viſcus may be diſturbed, and conſequently a trembling produced; but in this caſe repeated bleeding with cooling clyſters, antiphlogiſtic purges, a thin diet, *&c.* are of the greateſt uſe. But if in the end of an acute fever the body, being exhauſted by the diſeaſe and preceding evacuations, is invaded with a trembling, in that caſe theſe remedies will increaſe the cauſe of the trembling, namely too great inanition, and bring on conſequences certainly pernicious. But fleſh-broths, a moderate uſe of wine with frictions, exerciſe of body, corroborating and ſtimulating cordials, *&c.* are then of the greateſt uſe, when in the firſt caſe they would have been highly pernicious. It is therefore evident, that in the cure of a febrile trembling one ought to attend to the time of the diſeaſe wherein it happens.

# Of Anxiety or Oppreſſion in Fevers.

## SECT. DCXXXI.

ANGUISH or anxiety in fevers has for its cauſe an obſtruction of the blood coming out of the heart; which therefore ſuppoſes that the courſe of it through the extremities of the aorta and pulmonary arteries is almoſt impracticable; hence it alſo ſuppoſes a ſpaſm or cramp of the ſmall contracted veſſels, or elſe that the inflammatory matter is very incapable of paſſing through them: the like anguiſh we obſerve from an obſtruction in the courſe of the blood through the vena portarum from the ſame cauſes, becauſe all the venal blood brought thither from the cæliac and meſenteric arteries, being incapable of returning, ſtagnates, diſtends the veſſels, and reſiſts the affluent blood coming next from the arteries, whence it produces all the diſorders that either do or may follow from thence; whence it is evident, that theſe two cauſes of anxiety ought to be very carefully obſerved and treated in every acute diſeaſe.

Pain and anguiſh are thoſe things which are capable of rendering the condition of man miſerable; and therefore theſe are ſo much deteſted by human nature, that we uſe all our endeavours to remove every thing which may be the cauſe thereof. But as the diſpleaſing ſenſation in the mind which we call pain cannot be explained in words (ſee § 220) ſo the ſame is alſo true of anxiety; for he only is ſenſible of this who ſuffers the anguiſh. But although we cannot diſtinctly underſtand that change in the mind which attends anguiſh, yet we may be able to enquire into the changes which ariſe in the body from the perception of anxiety in the mind: for this will be ſufficient for the purpoſes of the phyſician, whoſe buſineſs is the care of the body and not of the mind. We ſhall therefore carefully ſearch after the corporeal changes, which either precede or accompany the ſenſe of anguiſh; and when theſe are known we ſhall ſee by what methods, and by what remedies thoſe changes may be ſpeedily and ſafely removed, becauſe this moſt troubleſome diſorder requires ſpeedy relief.

When the heart cannot expel the blood contained in its cavities by driving it forward through the arteries, anguiſh is perceived, and the greater as the obſtacle impeding the free egreſs of the blood from the heart is more powerful or reſiſting. But ſo long as life continues an ingreſs of the venal blood into the cavities of the heart, an expulſion of it from thence into the arteries is abſolutely neceſſary (ſee the comment to § 1); and therefore in this caſe anxiety denotes that life is dangerouſly attacked even in its fountain head; and therefore it is evident how much danger then attends. But that the ſenſe of anguiſh is then perceived, when the free egreſs of the blood is hindered from the cavities of the heart, appears from the moſt certain obſervations. For towards death the moſt intolerable anguiſh attends, and the laſt agonies and ſtruggles of dying people ſeem to be nothing more. Thoſe unhappy people who have polypoſe concretions in the cavities of the heart, or larger blood-veſſels near the heart, ſuffer the moſt dreadful anxieties, whenever the velocity of the blood is accelerated by a bodily exerciſe; whereas when they are perfectly at reſt, they find themſelves well enough, becauſe the blood moving gently, eaſily ſlips by, and is expelled through the arteries. Does it not therefore ſeem that as the ſenſe of pain denotes that a diſſolution is threatened to the nervous fibres ariſing from the brain, ſo anguiſh denotes the vital viſcera and life itſelf to be in danger? Certain we are, that the heart however ſwiftly agitated in a moſt acute fever, and the lungs ſtuffed up with impervious blood in peripneumonic patients, do neither of them feel pain, but the moſt intolerable ſenſe of anguiſh is perceived, obliging the patient even againſt his will to alter his ſituation of body, or to uſe any other endeavour to alleviate ſo deſperate a malady. But whether or no as the idea of pain is excited in the mind by the extenſion of the nervous fibres ariſing from the brain, ſo the ſenſe of anguiſh proceeds from the nerves diſperſed through the vital viſcera from the cerebellum, but not from the brain, muſt remain a queſtion, however probable.

But ſince the right ventricle of the heart drives the blood through the pulmonary artery, and the left ventricle propels the blood thro' the aorta, it is evident that the cauſe of anxiety, namely the obſtructed egreſs of the blood from the heart may reſide both in the pulmonary artery and in the aorta. But ſuch an impediment or obſtacle is moſt frequently found in the pulmonary artery, becauſe the blood propelled by the right ventricle into the large trunk of the pulmonary artery, is immediately obliged to paſs through its moſt narrow exremities into the veins, and from them into the left ventricle; and therefore the blood will heſitate immediately in its paſſage through the lungs. Even the blood being propelled through the narrow extremities of the pulmonary artery, becomes fit to flow through all the other veſſels in the body, as is demonſtrated by phyſiology; and therefore when the blood arrives into the left ventricle, it will be able to paſs through the extremities of the aorta, unleſs it be altered in its courſe through the lungs, either from a narrowneſs of the veſſels, an error of place, or a loſs of its moſt fluid parts, with cold, *&c.* Moreover, while there is an obſtacle or impediment about the extremities of the aorta, hindering the left ventricle from freely diſcharging its blood, that will alſo prevent the pulmonary veins from diſcharging their blood into the left ventricle; hence the lungs will be ſtuffed up in a little time, and a great reſiſtance formed to the right ventricle, Hence it is evident that anxiety ariſes from the egreſs of the blood impeded from the heart, and ſtagnating more eſpecially in the right auricle and ventricle, and extremities of the pulmonary artery.

But as we here treat of anxiety as a ſymptom in fevers, the obſtructed courſe of the blood will ariſe either from a ſpaſm and conſtriction of the ſmall veſſels, or from the imperviouſneſs of the blood to be tranſmitted, which, in this caſe, almoſt conſtantly proceeds from an inflammatory viſcidity therein. For although many other cauſes, as for example, ſcirrhous or ſuppurating tumours, *&c.* by an external compreſſion may ſtreighten the veſſels, and impede the free egreſs of the blood from the heart, and alſo polypoſe concretions, and a mucous, cold, indiſpoſition of the blood, *&c.* may render it impervious through the veſſels, yet theſe have no ſhare in the preſent conſideration, becauſe we here treat only of the hiſtory of a fever and its ſymptoms.

But it is very evident that the ſame effect muſt follow, whether the capacity of the veſſels be diminiſhed, without altering the fluids, or whether the veſſels retaining the ſame capacity the fluids become leſs pervious, as we explained it more at large in the hiſtory of obſtruction. But that the capacity of the veſſels may be leſſened, when their muſcular fibres are contracted with a ſpaſm, we are taught by experiments and obſervations. For the arteries act upon their contained fluids, not only by their elaſticity, but they have alſo truly muſcular fibres, as we are taught from anatomy, by the contraction of which fibres the capacity of the arteries may be ſtreightened: but that the contraction of theſe fibres may be increaſed is evident from what follows. When the moſt healthy perſon is ſuddenly ſtruck with fear, every part of the body is contracted and looks pale; for the arteries being conſtringed by a ſpaſm of their muſcular fibres repel back the red blood, as is evident even to the eye in the whole external ſkin. But that the ſame conſtriction likewiſe happens in the internal parts we are taught from the ſighings, anguiſh or oppreſſion, and difficult reſpiration which then happens from the difficult paſſage of the blood through the extremities of the pulmonary arteries contracted with a ſpaſm. The ſame thing likewiſe appears in the cold fit of intermitting fevers; for the extremities of the veſſels being contracted, and the powers of the heart weakened, as is evident from the paleneſs, a great reſiſtance begins to ariſe to the blood expelled from the heart, and from thence often follows very great anxiety during the time of the cold fit in fevers, eſpecially when ſevere; and even thoſe who die of theſe fevers almoſt conſtantly periſh in the cold fit.

But the imperviouſneſs of the humours to be tranſmitted through the veſſels, without leſſening the capacity of the laſt, may hinder their free courſe through the extremities of the pulmonary artery and aorta. For (as we ſaid before in the comment to § 382. N°. 8.) there is a natural propenſity in our blood to concretion, whence it ſpontaneouſly concretes by reſt: and health remains ſo long as the efficacy of the veſſels and viſcera is able to ſubdue this inclination in the blood to concrete. But it was proved before (§ 587.) where we treated of the effect of fevers, that they expelled the moſt fluid parts of the humours, and incraſſated the reſt; whence it follows that the blood's coheſion may be increaſed by a fever, and conſequently its paſſage through the extremities of the arteries may be thereby hindered. But when this fault of an increaſed coheſion ariſes in the blood, almoſt the firſt ſign thereof is perceived in the lungs, becauſe the blood is drove immediately from the right ventricle into the narrow extremities of the pulmonary artery. Hence follows a difficult and ſhort reſpiration, a toſſing or reſtleſsneſs of the body, anguiſh and ill-ſufferings of the patient, as they are called by Hippocrates, which afford certain ſigns, whereby we are taught that ſuch an imperviouſneſs ariſes in the blood as begins to impede its free courſe through the ends of the arteries. Hence in all acute diſeaſes theſe ſigns are juſtly eſteemed of the worſt import.

The ſame anguiſh we likewiſe ſee ariſe from the obſtructed courſe of the blood through the vena portarum from the ſame cauſes.] Another cauſe of anguiſh, and a very frequent one, is the blood's courſe impeded through the branches of the vena portarum, likewiſe occaſioned by the veſſels conſtringed with a ſpaſm, or from an imperviouſneſs of the blood. For it is well known from phyſiology that all the venal blood of the ſtomach, inteſtines, meſentery, pancreas, ſpleen, and omentum, is all collected in the one vena porta, except that ſmall portion

tion of the blood, which remaining after it has performed the nutrition of thoſe parts, is ſent into the cava by particular veins; but the porta having entered the liver acquires a ſtrong coat like that of the arteries, and immediately after dividing into large branches, it is then diſtributed in an infinite number of ſmaller veſſels throughout the whole ſubſtance of the liver, and having completed the ſecretion of the bile, the remaining blood is received by the ſmall veins, and poured into the cava It is therefore evident that the blood conveyed from the chylificative viſcera into the vena portarum, muſt again paſs through converging veſſels, ſo as to become twice venal before it returns to the heart: and therefore it is evident that the tranſmiſſion of the humours thro' the liver muſt be more difficult, as the venal blood muſt be forced thro' the ultimate ſmall extremities of the vena portarum in the liver without any new or additional force from the heart; and therefore an impediment or obſtruction may be eaſily formed to the free courſe of the humours through this part, in thoſe people who are deprived of the healthy exerciſes of body. But whether the obſtruction be formed about the ultimate extremities of the vena portarum diſtributed through the liver, or in the biliary ducts, or in the common excretory ducts of the latter, the effect will be nearly the ſame; namely, the courſe of the blood thro' the vena portarum will be impeded, and therefore the venal ſyſtem of the chylificative viſcera will not be able to empty themſelves into that vein: but theſe veins remaining full and diſtended, the arterial blood brought by the cæliac and meſenteric arteries, which ought to diſcharge themſelves into theſe veins, will likewiſe ſtagnate, and therefore a greater reſiſtance will ariſe in theſe arteries to the blood ſent through the aorta; therefore the left ventricle of the heart will be leſs able to empty itſelf into the trunk of the aorta, until thoſe obſtacles are removed, or the other branches ariſing from the aorta being dilated, may receive the blood which otherwiſe uſed to paſs through the cæliac and meſenteric arteries.

Perhaps from this cauſe it is that a greater quantity of blood being drove through the emulgent and adjacent arteries, a greater quantity of urine is ſeparated, which is a ſymptom commonly appearing in this kind of anguiſh; and this more eſpecially, if it derived its origin from a ſpaſm or convulſive conſtriction of the veſſels, from an inordinate motion of the ſpirits. For (*cæteris paribus*) the quantity of ſecerned liquor will be greater, as a larger quantity of the humour from whence it is ſeparated is applied to the ſecretory organs in the ſame ſpace of time.

This kind of anguiſh very often occurs in practice, namely, that ariſing from an obſtructed courſe of the blood through the vena portarum. For in many people, who ſeem in other reſpects healthy, an intolerable anguiſh ariſes of a ſudden; and is ſucceeded with moſt troubleſome vomitings, and ſoon after the whole body appears diſcoloured, as in a jaundice, whereupon the anguiſh then ceaſes: afterwards the bile mixed with the blood is gradually waſhed out by urine, the yellow colour of the ſkin vaniſhes, and recovers its healthy appearance; but ſome weeks after this, more or leſs, theſe ſymptoms uſually return again in the ſame order. The diſſection of dead bodies has taught us (as we ſhall declare more at large, when we come to treat of a jaundice) that in theſe people the common, or elſe the cyſtic duct of the bile is ſo obſtructed by ſmall ſtones, concreted bile, a tumour of the adjacent parts, *&c.* that the bile ſeparated from the blood of the vena portarum cannot evacuate itſelf by thoſe ways: whence it is accumulated, diſtends the receptacles in which it is collected, and fills the biliary ducts, ſo as to obſtruct the blood of the vena portarum from whence the bile ought to be ſecerned, whence the greateſt anguiſh enſues, until the bile is repelled by vomiting, as a ſalutary effort of nature, or by mixing with the blood it occaſions a jaundice. For when a perſon vomits, the viſcera contained in the abdomen are all of them compreſſed with a powerful force, by the convulſive motion of the diaphragm and abdominal muſcles; and by this compreſſure the ſecerned bile is repelled with a retrograde motion into the branches of the vena portarum; through which it either returns by the correſponding branches of the vena cava into the blood, or elſe is often repelled back with the blood of the vena portarum into the arteries. For the courſe of the blood in the arteries may be retrograde, ſo as to reſemble that in the veins, if a greater reſiſtance is made towards the arterial extremities, exceeding the power urging their contained fluid from the baſis towards the apex (as was ſaid in the comment to § 141. N°. 1.) Since therefore a reſiſtance is formed in theſe veins to the courſe of the arterial blood flowing into them, by ſome obſtacle placed about the extremities of the vena portarum; therefore when theſe parts are compreſſed by vomiting, the blood may be repelled into the arteries, more eſpecially as there are no valves in the branches of the porta diſperſed through the meſentery, which might reſiſt this retrograde courſe of the blood, as we are taught by Ruyſch [c]. From hence alſo appears the reaſon why the ſtomach or inteſtines being diſtended with flatulencies, anxiety follows, becauſe the veſſels being compreſſed by the tumour of theſe parts

[c] Adverſar. Anatom. dec. 2. pag. 11.

parts hinder the free courſe of the humours; but this anguiſh is immediately relieved upon a diſcharge of the flatus.

If therefore anxiety ariſes in an acute diſeaſe, it always deſerves the ſtricteſt attention, ſince it is often followed with ſo many bad conſequences, as are mentioned in the aphoriſm next following. Phyſicians often repent too late the errors committed in this reſpect, when for want of caution, and through hurry of buſineſs, they have neglected the complaints from anguiſh. A diligent enquiry ought therefore to be always made after the cauſe of the anguiſh, and the part of the body, wherein it is ſeated. For the greateſt danger attends the anguiſh ariſing from the courſe of the blood impeded through the pulmonary arteries: but that is leſs dangerous which proceeds from an obſtructed paſſage of the blood through the vena portarum, though even thence the worſt conſequences may follow: but that kind of anguiſh is of all the leaſt dangerous, which ariſes from flatulencies and a ſpaſmodic contraction of the veſſels through an inordinate motion of the ſpirits, as is often obſerved in hyſterical and hypochondriacal people. But by what ſigns theſe different kinds of anguiſh may be diſtinguiſhed, will be declared hereafter.

## SECT. DCXXXII.

IF therefore ſuch an anguiſh (§ 631.) continues long, it occaſions polypoſe concretions about the vital organs, inflammations, ſudden gangrenes with an intolerable oppreſſion and agonies, ſoon followed with death; but if the anguiſh is ſeated in the hypochondria, it then occaſions the greateſt uneaſineſs about the ſtomach, becauſe the other viſcera have their ſenſation leſs exquiſite; after this it occaſions ſudden putrefactions of the blood in the large and weaker veſſels of theſe hypochondriacal viſcera; whence gangrenes, a putrefaction of the liver, and a fatal dyſentery from the putrid matter.

If the cauſe of anxiety is ſeated in the vital viſcera, namely in the heart and lungs, it denotes that the courſe of the blood is impeded from the heart, as was ſaid in the preceding aphoriſm. But this diſorder is known to attend from the injury of the vital actions; namely the pulſe and reſpiration. For as the blood cannot be freely expelled from the heart, the arteries will not be dilated, whence the pulſe will be weak and wavering; and from the ſame cauſe there will be in a little time a coldneſs of the extreme parts, becauſe the blood cannot be propelled to the moſt diſtant parts of the body. But ſince a dilatation of the lungs by the inſpired air is required to give a free courſe to the blood, expelled from the right ventricle of the heart, through the narrow ends of the pulmonary artery; and it was demonſtrated in the preceding aphoriſm that the courſe of the blood would ſoon be obſtructed through the lungs, if the obſtacle to the free egreſs of the blood lay originally in the aorta; from thence the reaſon is evident, why in this kind of anguiſh the patient uſes all the efforts of reſpiration to procure a paſſage to the blood heſitating in the pulmonary artery; hence thoſe ſighings with a ſhort and difficult reſpiration, which they endeavour to relieve by ſitting up in the bed with an erect poſture of body, all which are much condemned in acute diſeaſes by Hippocrates. Therefore a difficult reſpiration with a wavering pulſe and coldneſs of the extremities denote that the cauſe of anguiſh is ſeated about the vital organs, and that death is at hand, unleſs timely relief be given.

For when the blood heſitates in the venous ſinus's and auricles, incapable of being propelled through the extremities of the arteries, it ſtagnates and concretes in a ſhort time, ſince it is in its own nature ſo apt to congeal, even in a healthy perſon. But the moſt fluid parts ſeparating from the groſſer, will as yet be able to paſs through the arteries, while the reſt becomes ſo much more inſpiſſated, and forms polypoſe concretions, which frequently are incapable of being diſſolved ever after during life, if the patient recovers from the preſent danger. Moreover, while the impervious blood is urged into the narrow extremities of the arteries by the force of the adjacent heart, and is more powerfully agitated by the fever (ſee § 371.) the vital viſcera will be inflamed, and for the ſame reaſon the inflammation there raiſed will ſuddenly turn into a gangrene (ſee § 328, and 422.) which is certainly and ſpeedily mortal (ſee § 432.) as frequently is known by ſad inſtances in a moſt violent peripneumony. At the ſame time there is alſo an intolerable oppreſſion, which obliges the unhappy patient to be continually changing his poſture of body, and toſſing himſelf every way in the bed, 'till the lungs being totally ſtuffed up, the patient expires ſuffocated.

But if the anguiſh is ſeated in the hypochondria, *&c.* ] Although this kind of anguiſh is not ſo fatal as the firſt, yet many bad conſequences are to be feared from thence, and it likewiſe oppreſſes the patient with the moſt intolerable ſenſe of anguiſh or uneaſineſs. But this is diſtinguiſhed from the former in that the reſpiration is not ſo much impeded, and the pulſe of the artery, though feveriſh, is ſufficiently free. But it ought more eſpecially to be obſerved, that although the chief obſtacle to the courſe of the blood through the vena portarum lies in the liver, yet the chief ſenſe of illneſs is perceived about the ſtomach, and more eſpecially about its upper orifice, which is uſually called cardia; for in this place the patient has a moſt troubleſome ſenſe of oppreſſing weight, ſoon after which they look yellow as in a jaundice by the return of the bile into the maſs of blood. To this place they always point, and I have even ſometimes ſeen them beat it with their fiſt, when they have been impatient of the extreme anguiſh. We know from anatomy that large nerves of the eighth pair are ſeated round the upper orifice of the ſtomach, and from thence they are diſtributed through all the other viſcera of the abdomen; perhaps hence proceeds that ſenſe of anguiſh in this part, when the circulation of the humours through the abdominal viſcera is diſturbed from the courſe of the blood being impeded through the extremities of the vena portarum in the liver. For although in the other viſcera from the ſame cauſe a great diſtenſion may ariſe, when the arteries cannot in the mean time empty themſelves of the blood which they bring into the veins, yet either theſe viſcera are leſs ſenſible, or at leaſt the ſenſe of anguiſh from that cauſe is not perceived in other parts: I have often ſeen wandering pains in various parts of the abdomen, ſometimes about the ſpleen, and ſometimes in the inteſtines, which have preceded a periodical jaundice; and the like obſervations we read to have been made by others: but then this ſenſe of anguiſh and indiſpoſition lies chiefly about the ſtomach. When Helmont [b] obſerved this, he pronounced, *Icterus namque nuſquam alibi viget magis, quam in atrio ſtomachi, unde ſuas excitat anxietates & ſuſpiria, deſignans ibidem teſſeram ſuæ ferociæ verſari.* "That a "jaundice reigned in no part more than in the "entrance of the ſtomach, from whence it excites "its anguiſh and ſighings, diſplaying there the "ſigns of its violence."

If now we conſider that the blood ſtagnates in the whole ſyſtem of the vena portarum, and that the whole liver is ſtuffed up with impervious blood, it will eaſily appear how many and how great diſorders are to be thence feared. For the blood of the vena portarum contains the immediate matter of the bile to be ſeparated by the intricate fabric of the liver; but the veſſels containing the bile already ſecreted are compreſſed by the adjacent obſtructed and diſtended veſſels, and frequently alſo the excretory ducts of both kinds of bile, namely the cyſtic and hepatic, are obſtructed in theſe diſeaſes, whence the worſt putrefaction muſt be expected. For it is obſerved that the bile very ſpeedily corrupts by ſtagnating, as it alſo does by too great a febrile heat; and in the dead bodies of animals

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[b] In fine Capituli: *confirmatur morborum ſedes in anima ſenſitiva*, pag. 451. N°. 13.

animals the firſt ſigns of beginning putrefaction appear about the liver. If now the blood is at the ſame time urged in theſe obſtructed veſſels by the force of a fever, there is juſt reaſon to fear a deſtruction of the veſſels, an extravaſation of the humours and a gangrene, and this more eſpecially as the liver is ſo ſoft and pliable, that its tender fabric may be eaſily broke even by a rough handling. Hence the reaſon is evident why a moſt putrid vomica or abſceſs is ſo often found in the liver after a jaundice; and why when the liver is ſometimes diſſolved into a putrid maſs, the moſt fœtid matter occaſions a fatal dyſentery. When continual remitting fevers were epidemical in theſe parts in autumn a few years ago, attended with a ſlight inflammation of the liver, we obſerved this anguiſh with a ſaffron colour of the urine, and a yellowneſs in the tunica adnata of the eyes, as in a jaundice; but it then appeared by many inſtances, that theſe fevers being badly cured by the bark, before the obſtruction in the liver was removed, a great many were carried off by a moſt putrid dyſentery, following after the anguiſh and weakneſs had continued for a long time.

## SECT. DCXXXIII.

HENCE the phyſician derives a juſt acquaintance with the cauſe, nature, and preſages of this anguiſh (§ 631, 632.) and at the ſame time will be able to diſtinguiſh betwixt the anguiſh ariſing only from a diſorder of the nervous ſyſtem without any preceding fever, and betwixt that which ariſes from an acute inflammation, which in that caſe has firſt ſhewed itſelf by its proper ſigns: and from thence by comparing theſe particulars together with the violence, duration, and part affected by the diſeaſe, he will be able to make a prudent diſcovery of the reaſon why anguiſh at laſt cloſes the tragedy almoſt in every diſeaſe towards the article of death? Why a ſpaſmodic or nervous anguiſh is but little dangerous, and why an inflammatory one is extremely ſo? Why reſtleſſneſs, toſſings, ſighings, difficulty of breathing, and conſtant wakefulneſs, are the forerunning meſſengers of death in moſt inflammatory and ſuppurative diſeaſes.

From what has been ſaid in the two preceding aphoriſms, it appears that anguiſh is diſtinguiſhable into two kinds, one of which, being ſeated about the vital viſcera, acknowledges for its nature and cauſe an obſtructed egreſs of the blood from the heart, and impracticability of its courſe thro' the extremities of the arteries; and more eſpecially an obſtruction is then formed about the extremities of the pulmonary artery, as we demonſtrated before. This kind of anguiſh is known by a difficult reſpiration, a weak and irregular pulſe, a coldneſs of the extreme parts of the body, and great oppreſſion. This anxiety is always of a bad preſage, becauſe there is reaſon to fear either ſudden death, or the formation of polypous concretions by the blood here ſtagnating, whence afterwards follow dreadful palpitations of the heart, greatly increaſing upon the leaſt motion of body, with faintings, difficulty of breathing, and many

more

more of the worſt ſymptoms. The other kind of anguiſh has its ſeat in the hypochondria, and is diſtinguiſhed from the firſt, in that the pulſe is here little or nothing altered, nor is the reſpiration ſo much injured, ſince the obſtruction is neither in the lungs nor in the arteries, going out of the heart, but is fixed about the extremities of the vena portarum: the principal ſign of this laſt is the ſenſe of an intolerable oppreſſion about the cardia or left orifice of the ſtomach. But although this laſt anguiſh is not ſo dangerous as the firſt, yet many bad conſequences are thence to be feared, as we have already ſeen in the preceding aphoriſm.

But it ought more eſpecially to be diſtinguiſhed in every anguiſh, whether the courſe of the blood through the narrow extremities of the arteries is impeded from an inflammatory thickneſs of the blood; or whether the capacity of the veſſels themſelves is contracted by a ſpaſm; for theſe different cauſes require a very different method of cure. For in ſome people the nervous ſyſtem is ſo eaſily moveable and ſuſceptible of irritation, and the motion of the moſt ſubtle fluid is ſo eaſily diſturbed, that the greateſt anguiſh, conſtriction of the veſſels, wonderful pains, convulſions and the like, ariſe even from ſlight affections of the mind. But, how frequently this cauſe of anxiety is to be found, we are taught by Sydenham [c], who has ſo accurately deſcribed the hiſtory of that wonderful and multiform diſeaſe, which is by phyſicians uſually termed an hyſterical or hypochondriacal fit: for he has obſerved that half our chronical diſeaſes proceed from that affection. For there are very few women altogether free from this diſeaſe; and if any, 'tis thoſe who lead a life ſubject to hard labour: and even moſt part of the men who give themſelves up to the ſtudy of learning, or lead a ſedentary life, are obnoxious to the ſame diſeaſes. But Sydenham has obſerved it as a thing moſt ſurpriſing in this diſeaſe, that in whatever part of the body this diſturbance of the ſpirits invades, immediately ſuch ſymptoms are produced as are conformable to the part, ſo that it reſembles almoſt every diſeaſe, and may eaſily lead the phyſician into error, unleſs he is very ſkilful and carefully attends to every circumſtance. The forementioned author has enumerated the various appearances of this diſeaſe almoſt through every part of the body, and has taught that all theſe diſorders, however different they may ſeem, proceed nevertheleſs from one root, and may be removed by the ſame method. For the nature or eſſence of this diſeaſe conſiſts in the nervous ſyſtem being too eaſily moveable, and in the ſpirits being leſs firm; which laſt, as Sydenham [d] expreſſes it by an admirable phraſe, *Supremum in ſcala materiæ gradum conſtituunt, in ipſo entis immaterialis confinio poſiti.* "Make up the moſt ſupreme ſtep in the ſcale of "matter, being placed at the confines or limits of "the immaterial being itſelf." For as is the condition of the blood, ſuch will be that of the ſerum, and ſuch the lymph, and all the thinner humours which ſeem to be thence ſecreted; but in weak girls, and in men who look pale by continual application to books with little or no exerciſe of body, the blood taken from a vein looks like a reddiſh water; whereas the blood of a ruſtic exerciſed with hard labour immediately congeals into a ſolid, ſciſſile maſs; and even the ſerum itſelf of the blood in theſe laborious men, is often too much inclined to concretion; and hence it ſeems very probable that this moſt ſubtle fluid of the nerves in us may have various degrees of coheſion, as well as the blood from whence it is derived. But we ſee daily that the moſt tender girls and weak men, who have ſuch a looſe texture of the blood, are ſoon thrown into a diſturbance all over by the ſlighteſt paſſion of the mind, and are immediately put into a trembling by the ſlighteſt alarm, while the hardy ploughman would ſcarce take fright, even at the ruin of the world: nor does it ſeem that this intrepidity ought to be aſcribed in ſuch a man to inſuperable ſtrength and magnanimity of ſoul, but it only proceeds from hence, that his body being rendered hard or callous by daily labour, is leſs affected by the ſame ſhock, while the compages or texture of all his juices is likewiſe more firm. For as Sydenham obſerves [d], *Animi enim robur & conſtantia, quamdiu hoc corporis luto is incruſtatur, a firmitudine ſpirituum eidem famulantium maximè pendet.* "Strength and conſtancy "of mind, ſo long as it remains incruſted over "with this body of clay, depends chiefly on the "firmneſs of the ſpirits dwelling therein." It is therefore an unjuſt treatment which is offered to hyſterical and hypochondriacal people by their friends, and often phyſicians, who blame them as if it were their own fault for being diſturbed at ſuch ſlight cauſes, or as if they could allay thoſe diſturbances by reaſoning. For as Sydenham obſerves [e], *Non citius remedium adferet pertinax aliquod vel inſolentiſſimi ſtoici decretum, quam odontalgiam præcaverit is, qui firmiter ſtatuerit, ſe nullo modo permiſſurum, ut dentes dolore pertententur.* "An obſtinate or inſolent ſtoical decree or maxim will "no ſooner relieve ſuch unhappy patients, than

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[c] In Diſſertatione Epiſtolari de Paſſione Hyſterica, pag. 486.

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[d] In Diſſertatione Epiſtolari de Paſſione Hyſterica, pag. 503.

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[d] Sydenh. ibidem.

[e] Ibidem.

"he would be able to prevent the tooth-ach, who "ſhould firmly aſſert that he would by no means "conſent for the teeth to be diſordered with pain."

But this anguiſh ariſing from a diſorder of the nervous ſyſtem, is known from its being preceded with no fever, and from the patient's habit being ſuch as denotes the ſolids to be very tender, and the fluids leſs firm, while there has been ſome antecedent commotions of the mind, or ſudden and profuſe evacuation of the fluids, excited either ſpontaneouſly, or by the taking of vomits, purgatives, *&c.* for daily obſervations teach us, that hyſterical and hypochondriacal people find themſelves greatly indiſpoſed by the ſtronger evacuating remedies of any kind. But the moſt certain and pathognomonic ſign of all is, when ſuch patients diſcharge a great quantity of a very limpid urine, either a little before, or while the anguiſh is preſent. By this flux of urine Sydenham confeſſes that he was chiefly enabled to diſcover this wonderful diſeaſe, while putting on various faces it reſembled almoſt every other diſorder. But that kind of anguiſh or anxiety which ariſes from an inflammatory viſcidity of the blood, and from an impediment of its courſe through the extremities of the arteries, is accompanied with a fever (ſee § 588.) and is almoſt conſtantly preceded with an acute fever, and being attended with the ſigns of inflammation (§ 382.) it is thereby ſufficiently diſtinguiſhed from that anxiety which ariſes from a diſturbance of the nervous ſyſtem. But how neceſſary it is carefully to diſtinguiſh theſe kinds of anguiſh by their proper ſigns, will be made evident in the following aphoriſm, treating on the cure of anxiety, which is often required to be attempted by oppoſite remedies in theſe caſes.

If now we alſo conſider the different degree of intenſity, duration and place where the anguiſh firſt ariſes, every thing elſe which relates to the prognoſis may be thereby diſcovered. For the more violent the anguiſh, and the longer its duration, ſo much the worſe diſorders are to be expected. For if the cauſe of the anxiety continues long about the extremities of the pulmonary artery, either from an imperviouſneſs of the blood, or a ſpaſm, as happens in a periodical aſthma, there is the greateſt danger of polypoſe concretions being formed by the blood in the large veſſels and receptacles near the heart; and alſo of a varicoſe or aneuriſmatic dilatation of the large veſſels paſſing out of the heart, and even of the heart itſelf: and from thence the moſt unhappy and incurable diſorders would remain, even after the obſtacles and anguiſh have been removed, as we obſerved before on another occaſion in the comment to § 176. From what has been ſaid, alſo, a reaſon may be given to ſolve the following queſtions.

Why anguiſh at laſt cloſes the tragedy almoſt in every diſeaſe towards the article of death?] For if we except thoſe diſeaſes which extinguiſh life in a moment, (as when the moſt healthy people ſuddenly drop down dead in the plague, as they are walking the ſtreets without perceiving any diſorder, as we mentioned before upon another occaſion;) except theſe all other diſeaſes towards death occaſion the moſt ſevere anguiſh; for nothing more than this does that ſtruggle ſeem to be which happens betwixt life and death in dying people. But if we conſider the appearances which happen about death, the reaſon will be evident. For when a perſon is about to die, the powers of the heart are weakened, as we are taught by the pulſe; and the blood cannot be propelled to the extreme parts of the body, whence enſues a paleneſs and coldneſs of the extremities: By this cold the cutaneous veſſels are conſtringed, and thence the venal blood derived into the larger veins tends towards the right ventricle of the heart: The arteries likewiſe being contracted by this coldneſs, and being no longer diſtended by the blood, impelled by the now weakened powers of the heart, move their blood back again in a retrograde courſe towards the heart; whence ariſes a great reſiſtance to the left ventricle, which being thus unable to empty itſelf, therefore the pulmonary veins likewiſe cannot evacuate their blood into the ſame left ventricle; hence the lungs will be filled full of blood, and the greateſt reſiſtance will thus ariſe againſt the right ventricle, which the dying patient endeavours to remove by the utmoſt efforts of reſpiration: But the pulmonary arteries remaining thus full, the right ventricle palpitating with a very ſwift motion, urges and ſtill more diſtends thoſe arteries already full, and forces out a humour thicker than uſual into the air cells of the lungs, which humour the patient not being able to expectorate, fills up the trachea or wind-pipe, and its branches, and occaſions that diſagreeable rattling which is obſervable in the air veſſels of the lungs, the dilatation of which by inſpiration is thus more and more impeded; hence the reſiſtances to the right ventricle of the heart increaſe, 'till at length it is perfectly at reſt, with the perſon. But it was proved at § 631, that the cauſe of anguiſh is the egreſs of the blood impeded from the heart; but as this impediment takes place eſpecially in dying people, the reaſon is evident why the greateſt anguiſh always attends in the article of death. This account is confirmed by thoſe people who have recovered, and ſurvived after having been ſuffocated under water, or hanged with a cord: For all of them teſtify that they perceived the greateſt anguiſh, and ſoon after loſt the ſenſe of every thing. There was an old gardener living a few years ago, who in his flight from the enemy was hung up upon a tree, but was afterwards ſet at liberty by cutting the halter; and this man has often affirmed to our author the celebrated Boërhaave, that while he was hanging he ſaw immediately a great light like that of lightning, and at the ſame time perceived an intolerable anguiſh, but afterwards he became inſenſible, and remembered nothing till he came to himſelf again. It is therefore not without reaſon that Seneca[g], having experienced the anguiſh of a periodical aſthma, affirms, *Brevis autem valde, & procellæ ſimilis, impetus eſt, intra horam ferè deſinit. Quis enim diu exſpirat? omnia corporis incommoda, aut pericula, per me tranſierunt: nullum mihi videtur moleſtius. Quid ni? aliud enim quidquid eſt, ægrotare eſt: hoc eſt, animam agere. Itaque medici hanc meditationem mortis vocant.* "That the "violence of it is very ſhort, and like a ſtorm "terminating almoſt within an hour. For who "can be long expiring? All the dangers and "inconveniencies of body have paſſed through "me: But none ſeems to me more troubleſome "than this. But what is more, any other kind "of diſorder is only being ſick; but this is the "giving of up one's ſoul. Therefore phyſicians "call this the working of death."

Why a ſpaſmodic or nervous anguiſh is but little dangerous, while an inflammatory one is extremely ſo?] Becauſe in the firſt caſe, when the anxiety has increaſed ſo as to bring on a fainting, the ſpaſm which invaded, goes off while the perſon faints by the convulſive anguiſh, becauſe the heart then cannot propel the blood with its due force to the encephalon, and therefore it cannot move the ſpirits through the nerves; whence the inordinate influx of them into certain parts will ceaſe, and relieve the anguiſh. This is evident by daily obſervation in hyſterical women, when the muſcles of the gula being contracted with a cramp, retain the air in the tube of the œſophagus that was before received into it, where expanding by the heat of the parts it occaſions a large tumor, and compreſſes all the adjacent parts with a ſenſe as it were of immediate ſuffocation: For ſo ſoon as theſe women begin to faint, the cramp ceaſes, and the confined air is diſcharged by ructus, with a conſiderable noiſe, whereupon the whole diſorder goes off. In thoſe afflicted with a convulſive aſthma there is often the ſame appearance; for the ſpaſm terminating, while the patients ſeem to be ſtruggling betwixt life and death, gives them an opportunity to recover; and though they ſuffer a hundred fits of the ſame nature, they always recover afterwards, unleſs by ſo frequent a repetition of the diſeaſe, polypoſe concretions, or a morbid dilatation ſhould happen in the veſſels next the heart, or in the heart itſelf, whence ſudden death often enſues. What is of great ſervice in this caſe in hyſterical and hypochondriacal people, to whom theſe convulſive anxieties are ſo familiar, is the weaker inclination of their blood to concretion, whence there is not ſo much danger of polypoſe concretions, and the like conſequences which might thence follow.

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[g] Epiſtola 54. pag. 474.

But in an inflammatory anguiſh the impervious blood heſitates about the extremities of the arteries, and the blood, being drove by the heart againſt the obſtacles, expels the moſt fluid parts, and condenſes the reſt, whence the cauſe of the diſorder is increaſed every moment, and death ſoon follows, unleſs the inflammatory obſtructing matter can be ſpeedily diſſolved, which it often cannot.

Why reſtleſſneſs, toſſings, *&c.*] The congeries of theſe bad ſymptoms ſeems to be expreſſed by Hippocrates in the ſingle word δυσφορίης, which denotes oppreſſion or intolerability of the diſeaſe, as Duretus obſerves [h], and which he always condemns as a fatal ſign in diſeaſes; namely, when the patient ſo difficultly ſupports the diſeaſe, that he is impatient of all manner of ſituations, poſtures, and places. On the contrary, he bids us expect every thing that is good, when the patient eaſily ſupports the diſeaſe. But even the common people have made it a conſtant obſervation, as an ill preſaging ſign in diſeaſes, when the patient without any juſt cauſe inſiſts upon changing his bed, or of lying in another place; and when ſuch patients endeavour with reſtleſſneſs of body to be continually changing their poſture almoſt every moment, they are by an apt phraſe ſaid to be taken or ſeized with death. For that anxiety and continual toſſings of body, with ſighings and ſhortneſs of breath, denote that the blood can be no longer propelled from the right ventricle of the heart through the lungs, and therefore that ſuffocation and ſpeedy death are at hand; whether the cauſe be an inflammatory thickneſs in the blood, obſtructing the ends of the pulmonary artery, and rendering them impervious, or from a conſumption of the lungs in ſuppurative diſeaſes, in a phthiſis, empyema, *&c.* or from ſuch a weakneſs of the vital powers exhauſted by force and long continuance of the diſeaſe, that they are no longer able to propel the blood through the narrow extremities of the arteries. But that continual wakefulneſs

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[h] In Coac. Hippoc. pag. 3, & 4.

fulneſs muſt alſo attend at the ſame time is evident, becauſe the ſevere anguiſh totally interrupts all ſleep.

But it is to be obſerved, that the reſtleſs agitation of body only, is not always a fatal ſign in diſeaſes, unleſs a ſhortneſs of breath and ſighing alſo attend, which denote that the courſe of the blood is impeded from the right ventricle of the heart through the lungs. For this toſſing of the body with anguiſh, frequently accompanies a critical diſturbance, but without any ſigns that the lungs are much overcharged. Thus anguiſh with wakefulneſs is by Hippocrates [i] enumerated among the ſigns of a future ſuppuration behind the ears. Among the ſigns of a future hæmorrhage he reckons ſudden anguiſh with watchings [k]. In another place he ſays, anxiety with a pain in the loins, brings a diarrhæa [l]. But thoſe toſſings of body which are attended with a coldneſs, are juſtly pronounced by Hippocrates [m] to be the very worſt, becauſe then the vital actions are the moſt oppreſſed.

## SECT. DCXXXIV.

FROM what has been ſaid likewiſe, it is evident what different methods of cure are required to alleviate this ſevere ſymptom or diſorder, all which methods may yet be readily underſtood and put in practice, when the nature of the ſymptom itſelf is fully

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[i] Prorrhet. Lib. I. Charter. Tom. VIII. pag. 802, 803. & in Coacis Prænotion. N°. 563. ibid. pag. 885.

[k] Coac. Prænot. N°. 113. ibid. pag. 858.

[l] Coac. Prænot. N°. 568. ibid. pag. 885.

[m] Coac. Prænot. N°. 2. ibid. pag. 853.

fully known. When therefore the cauſe is diſcovered to be a nervous or ſpaſmodic affection, it is removed by ſoftening the acrid, irritating matter (§ 603, to 606.) and by expelling it by vomits, purges, ſudorifics, diuretics and abſterſives; by diluting with warm watery liquors, by quieting the affections of the mind, and by relaxing the fibres, veſſels, and viſcera (§ 36, 54, 55.) and laſtly, by quieting the force of the nervous fluid with anodynes and narcotics. If it ariſes from an inflammatory viſcid, the cure is to be attempted by reſolving and diluting the fluids, and relaxing the veſſels; and laſtly, by reſtraining the impulſe of the vital fluid: to theſe purpoſes chiefly conduce plentiful drinking of warm water boiled with honey and barley, ſlightly aromatized, or rendered ſubacid, with an addition of nitre; by fomentations, cataplaſms, epithems, and emplaſters applied to the parts affected, and compoſed of diluent, laxative, emollient, and anodyne ſubſtances; by clyſters formed of the ſame ingredients injected often, and in ſmall quantities, ſo as to be retained if poſſible; by the vapours of warm water mixed with emollient ſubſtances, and continually directed or drawn into the noſe, mouth, and lungs.

Nothing has done more damage to the art of healing, than the including many diſtinct diſeaſes under one general denomination, whereby the unſkilful are often led into the moſt fatal errors. For if upon hearing the name of anguiſh any one immediately thinks of a remedy, before he has firſt carefully found out the immediate and preſent cauſe of the anguiſh in the body, he can only be ſerviceable by accident, and will often greatly injure the patient, even though he adminiſters the moſt celebrated remedies; becauſe the ſame diſeaſe requires a different method of cure, according to the different cauſes from whence it proceeds. The ſtrongeſt ſtimulating medicines, ſuch as ſpiritus cornu cervi, ſalis ammoniaci, tinctura ſuccini, *&c.* are often of the greateſt uſe immediately given to hyſterical women, when the anxiety proceeds from a nervous ſpaſm or inordinate motion of the ſpirits: But the ſame given in an anguiſh proceeding from an inflammatory thickneſs of the blood, preventing its courſe through the extremities of the aorta or pulmonary artery, are truly poiſons, and greatly increaſe the diſorder. But on the other hand, profuſe bleeding is one of the greateſt remedies for an inflammatory anguiſh; whereas in hyſterical women, unleſs they are alſo plethoric, a conſiderable loſs of blood, or any other profuſe evacuation would be highly injurious. Hence it is evident, that the nature of this ſymptom ought firſt to be known, according to the ſigns enumerated in the laſt preceding aphoriſms, before a method of cure can be undertaken with ſucceſs. Since therefore the principal difference lies betwixt the inflammatory and nervous or ſpaſmodic cauſe of anguiſh, therefore a twofold method of cure chiefly is required. For that difference which proceeds from the part affected, does not make any conſiderable alteration, unleſs topical remedies can be applied to the affected part: For whether the impervious blood cauſing the anxiety, is lodged in the extremities of the arteries, or in the ends of the vena portarum, the indication will be the ſame, namely to diſſolve the impacted matter, and open the paſſages: But warm watery vapours taken in by inſpiration come directly into the lungs, and prove very uſeful, by relaxing the veſſels, diluting the humours, &c. as we ſhall preſently declare: But when the diſorder is ſeated in the liver, fomentations applied to the hypochondria, clyſters of the like kind injected, &c. are deſervedly recommended.

When therefore the cauſe is diſcovered to be a nervous or ſpaſmodic affection, &c.] It ought here to be more eſpecially remarked, that ſometimes the ſpaſmodic cauſe of the anguiſh proceeds only from a change in the thoughts, without any thing corporeal; as when an hyſterical woman only by recollecting a former affront, relapſes into a paroxyſm: But oftentimes there is ſomething applied to the nerves, which are plentifully diſtributed thro' various parts of the body, having the property of diſturbing frequently the whole nervous ſyſtem, and of exciting wonderful ſpaſms, and intolerable anguiſh. Thus the fragrancy of muſk, ambergreaſe, and civet, only by affecting the olfactory nerves, frequently excite fits: And we are even taught by obſervations in phyſic, that the nerves placed in the moſt remote parts of the body being injured, may diſturb the whole common ſenſory, with all the functions thereon depending. But theſe wonderful effects are the moſt frequently obſerved, when the nerves diſtributed through the ſtomach and inteſtines, are irritated by acrid ſubſtances, or, by ſordes there collected, creeping worms, &c. For an inſpiſſate and inactive phlegm, fluctuating in the ſtomach, may occaſion a troubleſome anguiſh, which immediately ceaſes when the phlegm is diſcharged by vomit; and the ſame is frequently obſerved in weak people, after taking aliments of a difficult digeſtion. But in fevers this anguiſh ariſes the moſt frequently, when the bile rendered more than uſually acrid, either before or by the fever, flows into the ſtomach and inteſtines. The troubleſome anguiſh and reſtleſs agitation of body, which I have obſerved in myſelf, and in many others when afflicted with fevers, has been happily removed by giving a gentle vomit.

When therefore there is anguiſh in fevers without injuring the reſpiration, or without the ſigns of an inflammatory thickneſs in the blood, we ought always to think of the acrid bile, and enquire diligently whether any thing acrid or uneaſy lodged in the ſtomach or inteſtines is the cauſe of the anguiſh. But in what manner the acrid irritating matter may be mitigated, has been ſaid before under the aphoriſms cited in the text. But the ſpeedieſt cure of all is by expelling the acrid, offenſive matter from the body, which induced the ſpaſmodic anxiety, by irritating the nerves of the ſtomach and inteſtines. For if this acrimony lies in the ſtomach, it may be moſt commodiouſly removed by a vomit; but if it lies in the inteſtines, it is beſt diſcharged by a medicine purging downwards. But the milder vomits and purges are always moſt convenient in this caſe (of which kind are thoſe furniſhed in the *Materia Medica* of our author, at the number correſponding to that of the preſent aphoriſm) to avoid increaſing the fever by exciting too great a tumult. Nor yet frequently is the maſs of ill humours exciting all theſe diſorders, and lodged in theſe parts, any thing conſiderable. For Sydenham[n] confeſſes that he has often been ſurpriſed, when upon examining what the patient had ejected by vomit, he found the matter expelled, neither appearing conſiderable in

quantity,

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[n] Sect. I, cap. 4. pag. 65.

quantity, nor endowed with any bad qualities, and yet after this diſcharge the ſickneſs, anguiſh, reſtleſſneſs or toſſings, the troubleſome ſighings, and other bad ſymptoms were allayed in theſe fevers, ſo that the remaining part of the diſeaſe became eaſily tolerable: but when he was afraid, leſt the veſſels over diſtended with blood, ſhould burſt in the brain or lungs by the ſtrainings to vomit, he firſt premiſed bleeding, and quieted the diſturbances raiſed by giving a paregoric medicine after the operation of the vomit or purge; and thus he found that this ſymptom might be ſafely removed in fevers. In infants, when the ſtomach is loaded with a maſs from the curdled milk, which can neither be expelled upwards nor downwards, on account of its too great bulk, anguiſh is obſerved to follow from this cauſe, which the poor infant expreſſes by a reſtleſs agitation of body, and is frequently carried off by convulſions, excited from the ſame cauſe. In that caſe may be given Venice ſoap, ground and diſſolved in the yolk of an egg, that the concreted maſs may be divided, attenuated, and afterwards expelled by a gentle vomiting or purgative medicine.

It ſometimes happens that this irritating cauſe of the anguiſh refuſes to be expelled by theſe ways, but being of a much more ſubtle nature, it is carried off from the body by raiſing ſweats. This Sydenham [o] obſerved in a peſtilential fever, and ingenuouſly confeſſes the error which he committed. For he had the cure of a noble lady under an ardent fever, attended with vomiting, anguiſh, and the other ſymptoms before-mentioned: in this caſe after bleeding, he gave a vomit, which here had not the due effect, which he had ſo often known in other fevers, for a diarrhæa enſued, which in other fevers he had always known prevented by a vomit; and after this, ſymptoms perfectly irregular ſucceeded, and the patient died about the fourteenth day of the diſeaſe. After this he abſtained from the like practice in theſe fevers, and after a moderate bleeding premiſed, he attacked the diſeaſe with ſudorific medicines, and with the moſt happy ſucceſs, provided the ſweats raiſed continued for twenty-four hours without interruption, conſtantly ſupplying the patient with ſome warm, thin drink, a little aromatized; for towards the latter part of the forementioned time, the ſweat became more copious and uſeful by greatly relieving the patient. But if a troubleſome vomiting hindered him from adminiſtring a ſudorific medicine, he endeavoured to raiſe a ſweat only by increaſing the weight of bed-cloaths; and as ſoon as a ſweat began to appear, the vomiting immediately abated, *Cum materiæ morbificæ radii verſus ambitum corporis ſeſe exporrigerent.* "Becauſe (as "he expreſſes it) the morbific matter began "to extend in rays from within towards the "circumference of the body." Thus we learn that various methods are ſometimes neceſſary to be taken for the expulſion of the acrid irritating matter producing the anguiſh; but it is evident, that the warmer kinds of ſudorifics are to be avoided in fevers, for fear of too much increaſing the febrile motion; or if ſuch are given, they ought to be diluted in ſome thin drink, which was the practice of Sydenham. A formula or preſcription of ſuch a ſudorific decoction may be ſeen in our author's *Materia Medica* at the number correſponding to that of the preſent aphoriſm, conformable to which likewiſe many others may be compoſed; and theſe are uſeful in all caſes where it is required to dilute the humours, and relax the paſſages at the ſame time; and therefore they are beſt prepared of watery liquors with mild aromatics. Vinegar diluted with ſix or eight times the like quantity of water, with the addition of honey or ſugar till it is become palatable, and drank warm, is one of the beſt methods of raiſing ſweats, ſince at the ſame time that it dilutes the blood, it powerfully reſiſts all putrefaction. But all theſe liquors and ſudorific medicines act likewiſe as diuretics under a different regimen: for if theſe are adminiſtered while the patient's body is well covered with bed-cloaths, they generally excite ſweats; but if theſe are taken while the patient is expoſed to an air moderately cool, they rather operate by urine; but it is alſo evident, that theſe medicines are uſeful at the ſame time by diluting and abſterging.

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[o] Sect. II. cap. 2. pag. 153.

By quieting the affections of the mind.] That the moſt ſevere anxieties may ariſe from violent paſſions of the mind, is known to every one, more eſpecially from grief and fear. If therefore the febrile patient is one of weak nerves, or eaſily ſubject to irritation; if any thing ſhould happen to diſturb his mind, it is evident that the anguiſh thence ariſing does not proceed from the fever, or any fault in the humours not ſufficiently pervious, but from a diſturbance in the nervous ſyſtem by the commotions of the mind, which ought therefore to be quieted. But in what manner and by what means this is to be effected, has been already explained in the comment to § 104.

By relaxing the fibres, veſſels, and viſcera.] For the too violent and ſpaſmodic contraction of the fibres, and of the veſſels and viſcera, which they compoſe, impedes the free courſe of the humours through the veſſels: if therefore thoſe parts can be relaxed which are too much contracted, the diſorder will be removed. It is indeed true, that too great a rigidity of the ſolid parts is not ſo much the offending cauſe, but rather a morbid contraction

tion of them by the application of acrid ſtimuli, or elſe an inordinate influx of the ſpirits into the moving fibres; and therefore only ſuch things ſeem to be here agreeable, as remove and mitigate the irritating acrimony, or elſe quiet the inordinate motion of the ſpirits. But it is well known, that the natural contraction of the veſſels, may be ſo much leſſened by the application of relaxing medicines, that they will tranſmit much more groſſer humours than what they were accuſtomed to in health; and therefore the ſame medicines may diminiſh this morbid and ſpaſmodic conſtriction. Hence the antient phyſicians made uſe of ſoft and oily medicines for the cure of a tetanus, and rubbed the parts with the moſt emollient ointments; and even ſometimes they immerged the whole body of the patient thus affected, into warm baths of the ſame kind, as we obſerved before upon another occaſion in the comment to § 234, N°. 3. But in what manner the fibres, veſſels, and viſcera may be relaxed, has been already explained in the aphoriſms cited in the text.

By quieting the force of the nervous fluid with anodynes and narcotics.] How much uſe theſe are of to allay thoſe diſturbances, which have been raiſed by affecting the mind, has been ſaid in the comment to § 104. See alſo what has been ſaid in the comment to § 202 and 229, N°. 2. concerning the uſe and efficacy of theſe medicines. For in all caſes where there are ſpaſmodic affections, anodynes and narcotics afford the principal remedy. When therefore there is anxiety without the ſigns of inflammation, recourſe may be ſafely had to theſe. But how much good may be hoped for from a prudent uſe of theſe for removing anguiſh and other ſymptoms of the worſt kind, has been taught us by Sydenham, who obſerves that he was not able to alleviate the intolerable anguiſh in the ſecondary or putrid fever of the ſmall-pox by any means, but by narcotics, and thoſe often repeated, if this ſymptom was urgent; and he even remarks that many periſhed by this diſorder, becauſe they were deſtitute of theſe remedies. For when the variolous ichor is abſorbed into the blood, it diſturbs the whole, and kindles a moſt violent fever; whence Sydenham has obſerved ſuch violent commotions of the ſpirits to enſue in theſe patients, that unleſs they were quieted by theſe remedies, death ſoon followed. Hence he not only ordered a narcotic medicine to be given every eight hours in the worſt kind of the ſmall-pox, but he would likewiſe always have a doſe ready to be given, if in caſe the anguiſh and diſturbance ſhould return. But concerning theſe we ſhall treat more at large in the hiſtory of the ſmall-pox.

If it ariſes from an inflammatory viſcid, *&c.*] This is the moſt dangerous kind of anguiſh, more eſpecially if the inflammatory viſcid heſitates about the extremities of the pulmonary artery; for (as was ſaid before at § 631,) though the obſtacle which hinders the egreſs of the blood from the left ventricle of the heart, reſides primarily about the extremities of the aorta, yet in a little time it will alſo extend to and obſtruct the veſſels of the lungs, ſo as to make the like obſtacle or reſiſtance to the right ventricle of the heart, whereby it will be hindered from tranſmitting the blood through the lungs. But if the like diſorder is ſeated about the extremities of the vena portarum in the liver, it may give leſs uneaſineſs, though at the ſame time the very worſt diſorders may follow from it there likewiſe. The cure in both caſes requires the inflammatory viſcid to be reſolved and diluted, and the veſſels to be relaxed, that the impacted matter may be more eaſily tranſmitted;

and the cure will above all be ſooneſt effected, if both theſe intentions can be anſwered at the ſame time. But by what manner, and by what medicines theſe intentions may be accompliſhed, has been already declared in the hiſtory of inflammations (§ 395 to 401), and in the general cure of fevers (§ 612 to 616). But in the mean time the greateſt danger which often attends in this caſe, requires every remedy that is the moſt efficacious to be uſed at one and the ſame time. But it will be of the greateſt uſe ſo to reſtrain the impulſe of the vital fluids, that the blood may be no longer able to urge againſt the obſtructed parts with a great force, becauſe without this the moſt fluid parts only would be tranſmitted, and the reſt would be ſo much the more inſpiſſated, and drove farther into the narrow extremities of the larger veſſels, whence there would be great danger of the diſorder increaſing, and becoming more obſtinate every moment. Hence therefore a copious evacuation by bleeding will be uſeful, unleſs the extremities, being already cold, and the pulſe weak and irregular, denote that only a ſmall quantity of pervious blood is circulated through the veſſels; for then the leſſening of its quantity by bleeding often haſtens the patient's death. To this intention alſo conduce the application of ligatures to the limbs, that the veins being compreſſed for ſome time, may retain the blood from returning ſo plentifully to the heart, ſo as to increaſe the anguiſh. At the ſame time a diluent vehicle ought to be conveyed in all forms into the blood, by the drinking of farinaceous decoctions with honey and ripe garden fruits, adding ſome of the mildeſt ſpices, leſt the body, which is already too weak, ſhould be oppreſſed by ſo great a quantity of diluents; but more eſpecially here will be convenient, thoſe cooling, bitter, and milky plants, and their juices, concerning which we ſpoke before in the comment to § 614. To theſe may be added nitre, whoſe great efficacy in reſolving the inflammatory viſcid is well known. At the ſame time the like things are to be applied in the form of bath, fomentation, epithem, *&c.* to the bibulous veins in the external ſkin, more eſpecially about the parts affected, that the diluent and attenuant medicines received into the veins, may by all poſſible ways be conveyed to the obſtructions; for thus there will be hopes of the medicines paſſing to the heart, and from thence towards the obſtructed veſſels, which they may in ſome meaſure ſtill be able to pervade, as they are extremely thin or ſubtle; and at the ſame time, while they paſs through, being ground and ſhook together with the inflammatory viſcid by the action of the veſſels, in whoſe ſmalleſt extremities the matter heſitates, it will be thus partly diſſolved, and by that means a more open paſſage made for the blood expelled from the heart. The ſame uſes have alſo clyſters prepared of the like materials, which ought to be often injected, and in ſmall quantities at a time; becauſe if a great quantity of any liquor is injected by the anus, it ſoon after raiſes a teneſmus, and is evacuated again by ſtool. But the intention here demands liquor to be retained a long time, that it may be drank up by the mouths of the veins, opening into the cavity of the inteſtines, and from thence paſs immediately into the blood, to be mixed with it; hence therefore if the patient diſcharges the clyſter immediately after it is given, another of the ſame kind ſhould be repeated without delay: and in this method the patient ought ſtrenuouſly to perſiſt in every reſpect, till this dangerous ſymptom begins to be eaſier. Clyſters will alſo be of the moſt happy uſe, when the inflammatory viſcid heſitates in the narrow extremities of the vena portarum in the liver; becauſe what is taken up by the veins of the inteſtines is immediately diſcharged into the vena portarum, and conveyed, little or nothing changed, to the affected part. But it ſeems a neceſſary caution, that when the inflammatory matter cauſing the anguiſh is ſeated in the lungs, one ought not to preſcribe ſuch remedies as will take up ſeveral hours in their preparation. For a ſimple decoction of barley, with oxymel, nitre, juice of elder-berries, currants, and the like, which are always ready in the ſhops, will ſatisfy this urgent indication; and of the ſame materials clyſters may be likewiſe formed; for ſo dangerous a ſymptom requires the moſt ſudden relief: but in the mean time we may make uſe of theſe ſimple and moſt efficacious remedies internally, till others more operoſe can be prepared, if ſuch ſeem to be neceſſary. Hippocrates [p] obſerves, that the greateſt care and ſtricteſt regimen is neceſſary in thoſe fevers, which he calls (*aſſodes*) oppreſſing, accompanied with a continual toſſing of the body, a diſtenſion of the hypochondria, a coldneſs in all the extremities, and ſuch a reſtleſſneſs that the patient cannot continue long in the ſame poſture; but at the ſame time he orders them to take nothing more than oxymel with water, and in the mean time to lie down in the darkeſt and quieteſt apartment, in the ſofteſt bed, and to continue lying there for a conſiderable time, with as little toſſing as poſſible, (for by motion of the body the venal blood is accelerated towards the heart, and conſequently will be increaſed); he would likewiſe have linſeed boiled in water and oil applied warm to the hypochondria. Hence it is evident that Hippocrates treated this urgent diſorder by a method of cure ſimple enough. But if all theſe means, carefully applied, are of little or no ſervice, there ſeems to remain nothing more, but death muſt in a little time put a period to the anguiſh; that is to ſay, when the diſorder is ſeated in the lungs, for in the liver it is not ſo ſoon fatal. For the moſt precious remedies, as to price, namely, the porcupine and oriental bezoar, &c. will here avail nothing, however much they may be recommended by ſome: but in the mean time, that we may not ſeem to neglect any thing for the ſake of the rich, theſe or the like may be given, provided no confidence is placed in them, ſo as to neglect medicines much more efficacious.

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[p] De victu in morbis acutis. Charter. Tom. XI. pag. 145, 146.

But when the inflammatory viſcid cauſing the anguiſh heſitates in the lungs, it will be of the greateſt uſe to breathe in the vapours of hot water, as they are drawn immediately into the lungs: and although the principal efficacy is to be expected from the vapours of the water, yet emollient herbs are ſometimes added; though the emollient virtue of plants continues in the decoction or infuſion, and does not ſeem volatile enough to aſcend together with the vapour. But ſuch things are often added to prevent the too great ſimplicity of the medicine from bringing it into contempt. Thus the vapours of hot water, than which nothing relaxes more, being directly applied to the lungs, the obſtructed and diſtended veſſels, are thereby relaxed and opened, while the blood itſelf heſitating in the narrow extremities of the veſſels is diluted. For it ſeems very probable, that part of the watery vapours thus applied, are not only abſorbed by the bibulous veins, but alſo enter the ſmall arterial ducts, which exhale a moſt thin dew or vapour into the air cells of the lungs. For, as we obſerved before upon another occaſion (ſee the comment to § 393, N°. 3.) thoſe parts of the arteries which lie behind the obſtruction, are empty, and conſequently all the branches of ſuch an artery which ariſe from it beyond the obſtruction, will be alſo empty; and hence the vapour of the water may be able to enter thoſe ſmall branches, which open in the ſurface of the air-veſſels, and which will draw in the vapours by the ſame force, as the ſmalleſt tubes draw in contiguous liquors into their cavity. When therefore a diluent and relaxing remedy is thus applied externally to the affected part, and internally, the like remedies are conveyed thither agreeable to the laws of circulation, the obſtructing particles will then be attacked on both ſides, and every thing will then be effected which can be reaſonably expected from art, as it now ſtands. The celebrated author of theſe aphoriſms knew a man who was very famous in this city of Leyden, for happily and ſucceſsfully curing quinſies and inflammations of the lungs; but his method was to let the patient draw in warm vapours at the mouth by a funnel. But although he would not reveal what remedies he uſed, yet it was commonly known to be an infuſion of certain plants in water, with the addition of a quantity of vinegar. But he made his principal cures in quinſies, by cauſing the mature abſceſs about the fauces to break ſooner by theſe emollient vapours, towards which the concuſſion of theſe parts by coughing, excited from the vapours of the vinegar, greatly conduced.

## SECT. DCXXXV.

BUT if any where the ſeverity of a diſeaſe earneſtly calls for a ſpeedy and ſafe cure, it is certainly here.

For when anguiſh attends in a fever, eſpecially one that is acute and continual, and there are ſigns denoting that the extremities of the arteries being obſtructed, hinder the egreſs of the blood from the heart, death is at hand, unleſs theſe impediments can be ſpeedily removed, or at leaſt much leſſened. A phyſician ought therefore never to depart from a patient in this condition, without firſt acquainting his friends with the extreme danger, having before tried every thing whereby any relief might be expected. But altho' the like diſorder gives leſs uneaſineſs when ſeated in the extremities of the vena portarum of the liver, yet neither is this to be ſlightly paſſed, ſince the very worſt conſequences may thence follow, and the moſt troubleſome ſenſe of the ſevere anguiſh requires a ſpeedy relief. Moreover, in the nervous or ſpaſmodic anguiſh, the ſame is likewiſe true, although it is the leaſt dangerous of any of them: for if the diſorder ſeated in the pulmonary veſſels continues long, there will be reaſon to fear polypoſe concretions, with varicoſe or aneuriſmatic dilatations of the veſſels next the heart, and even of the heart itſelf.

The end of the Fifth Volume.

# THE

# INDEX.

## A.

ABDOMINAL viſcera, *how affected with anguiſh from obſtructions of the* vena portæ, Page 447

Abſceſſes, *how formed by a depoſition of the morbific matter in fevers,* 186

Abſtinence, *or low regimen, why improper for febrile patients who have been uſed to live high,* 260

Acids *how they cool in fevers from ſultry heats,* 283

Acid fumes, *how they correct putrid and peſtilential contagion,* 297

Acrimony *taken into the body, how it occaſions fevers,* 69, 303, 317

——— *external, how a cauſe of fevers,* 94

——— *of ſpices, how to be corrected,* 309

——— *the cauſe of a lentor by conſtriction of the arteries in fevers,* 344

——— *cauſing a ſpaſm of the arteries, how to be removed in fevers,* 345

Acuteneſs *of fevers, whence derived,* 16

Air, *damp, how it cauſes fevers by obſtructing the perſpiration,* Page 89
——— *how it occaſions fevers,* 83
—— *hot, how it occaſions fevers,* 94
—— *damp, how to be corrected in fevers,* 287
—— *putrid, cauſing fevers, how corrected,* 289
—— *cool, how uſeful to moderate the violence of fevers* 362
Alcaline Acrimony *of plants cauſing fevers, how to be corrected,* 311
——— ——— *from fleſh meats, how a cauſe of fevers,* 312
Aliments *forbid by the ancients in the beginning of fevers,* 229
——— *to be given in fevers when they are the leaſt violent,* 238, 240
——— *of aceſcents, why beſt in fevers,* 233, 285
——— *why to be given often and in ſmall quantities in fevers,* 241
——— *their kinds and quantities, how to be determined in fevers,* 242
Anguiſh, *how cauſed in fevers,* 145, 440, 445
——— *in fevers, its cauſes, immediate and remote,* 443, 450
——— *of two kinds, præcordial and hypochondriacal,* 456
——— *in fevers, how to be treated,* 466
——— *nervous, how to be treated,* 468
——— *inflammatory, how cured,* 474
——— *why it is always dangerous,* 480
Aromatic exhalations, *how they correct a too moiſt air,* 289
Arſenic *and* Antimony, *how corrected by* Sulphur, 297

B

Beginning *or firſt ſtage of fevers deſcribed,* Page 156

Bed, *often to be quitted by the patient in ſome fevers, to abate their violence,* 364

Bile acrid, *or exalted, how the cauſe of fevers,* 101

—— —— *cauſing anguiſh in fevers, how to be removed,* 469

Bladder paralytic, *from keeping the urine too long,* 316

Blood, *how it ſtagnates in the beginning of fevers,* 53

——— *how formed and conditioned in health,* 95

——— *how vitiated by fevers,* 140

——— *how it tends to concretion by reſt,* 303

——— *apt to form polypoſe concretions in the cold chill of fevers,* 409

Blood-letting, *how of uſe to abate the violence of fevers,* 365

———— *when to be uſed with caution in fevers,* 366

———— *generally bad for intermittents,* 368

———— *how it reſtores elaſticity to the veſſels,* 384

Brimſtone, *how the burning of it corrects putrid contagion of the air,* 298

Buboes *and* Parotids, *how formed by a depoſition of the morbific matter in fevers,* 186

C.

Cantharides, *their action upon the body,* Page 266
Cauſtic ſtimuli *cauſing fevers, how removed,* 267, 268
Changes *of fevers deſcribed,* 167
Chronical Diſeaſes, *how cauſed by fevers,* 5, 177
Circulation *of the blood, how increaſed in fevers,* 109
Climates diſtant, *why they require different aliments and remedies,* 257
Clyſters, *how uſeful to abate the violence of fevers,* 370
Cold, *how it cauſes fevers by obſtructing the inſenſible perſpiration,* 83
—— *its nature and eſſence deſcribed,* 404
Cold-ſhivering, *the firſt ſymptom of fevers from internal cauſes,* 45, 50
Cold-bathing, *how it removes chronical diſeaſes,* 152
Cold-chill *in fevers, whence it ariſes,* 405
——— ——— *what it denotes,* 412, 413
——— ——— *not to be treated with ſtimulating remedies,* 415
——— ——— *how beſt cured,* 417
Concoction *of morbific matter in fevers explained,* 114
——— *an effect of the fever itſelf,* 116, 211
Conſtriction *of the arteries a cauſe of lentor in fevers,* 343
Contagious Stimuli *examined as cauſes of fevers,* 224, 274
Contagion peſtilential, *not to be accounted for,* 292
Cordials, *whence ſo denominated.* 374
Criſes *in fevers explained,* 118, 167

Criſes, *at what times they moſt uſually happen,* Page 121
—— *are not to be obſerved in all fevers,* 126
—— *inſtances of them from* Hippocrates, 128
—— *why difficult to preſage with certainty,* 129
—— *to be preſaged with caution,* 131
—— *how they are liable to be diſturbed,* 134
Critical-depoſitions *the cauſes of other diſeaſes after fevers,* 179
—— —— *not to be diſturbed,* 185
Critical Sweats, *how diſtinguiſhable from morbid ones,* 200
—— —— Urines *conſidered in fevers,* 207
—— —— Symptoms, *not to be diſturbed,* 397

D.

Damps malignant *in the air, how diſcovered and removed,* 296
Death, *how it terminates fevers,* 169
Declenſion, *or going off of fevers deſcribed,* 165
Diagnoſis *of diſeaſes conſidered in general,* 220
Diarrhœa *critical in fevers conſidered,* 204
Digeſtion *and* Crudity *conſidered in fevers,* 75
—— *of aliments in fevers conſidered,* 232, 241
Diluents, *how uſeful in fevers from violent exerciſe,* 279
—— *the beſt remedies for the cold-chill,* 417
Diſeaſes, *how produced by an inſpiſſation of the humours from fevers,* 177
Drinks, *acrid, how they cauſe fevers,* 71
Drinking *of ſtrong liquors, its ill effects,* 322
Dropſies *cauſing fevers by an acrid lymph, how to be treated,* 275

E.

Elaſticity *of the veſſels, how reſtored by blood-letting in fevers,* Page 384
Emunctories *of the body deſcribed,* 327
——— *how ſet open for the cure of fevers,* 333
Epidemical Fevers, *their nature deſcribed,* 21
——— Acrimony *cauſing fevers, how to be treated,* 274
Eryſipelas *from a critical depoſition in fevers,* 180
——— *of the viſcera in fevers deſcribed,* 182
Excretions *obſtructed, how the cauſe of fevers,* 79
——— *of the morbific matter in fevers,* 194, 197
Excretions *critical, after concoction in fevers,* 210
——— *obſtructed in fevers, how remedied,* 330, 327
Exerciſe, *neglect of, how the cauſe of fevers,* 90
——— *violent the cauſe of fevers,* 93, 276
——— ——— *how to be treated,* 277, 280
Exhalations, *putrid, cauſing fevers, how to be corrected,* 291

F.

Faſting, *how long it may be ſuſtained before it kills,* 98
——— *the leaſt tolerable to children and growing people,* 250
Fat, *how returned to the blood and waſted by fevers,* 110, 112
Fear, *how it diſpoſes to the plague and contagious fevers,* 300

Febrile Matter, *how to be corrected and expelled,* Page 224
——— *often not expelled at all,* 393
——— *how it aſſumes the nature of pus,* 187
Fermented Liquors and Spirits, *how they operate on the body,* 318, 322
Fermented acrimony, *or gas of liquors deſcribed as a cauſe of fevers,* 317
Fevers, *whence ſo denominated,* 3
——— *why the moſt frequent of diſeaſes,* ibid.
——— *how they both cauſe and cure numerous diſeaſes,* 5, 7, 151
——— *why often to be encouraged, or only moderated,* 8
——— *their nature how to be diſcovered,* 9
——— *their eſſential ſigns or ſymptoms,* 13, 27
——— *acute, whence ſo called,* 16
——— *ſlow, their nature deſcribed,* 20
——— *why neceſſary to be conſidered previous to other diſeaſes,* 2, 25
——— *their proximate cauſe and eſſence,* 37, 61
——— *a claſs of diſeaſes of the heart,* 38
——— *from internal cauſes how they invade,* 45
——— *how they ariſe from a ſtagnation of the blood and irritation of the heart,* 52
——— *their remote cauſes claſſed,* 67
——— *their effects enumerated and explained,* 108
——— *how they cure themſelves,* 112, 348
——— *often excited by art to cure chronical diſeaſes,* 152
——— *ſhewn to be efforts of nature to remove diſeaſes,* 154
——— *their ſtages deſcribed,* 155
——— *how they end in death,* 169
——— *how they end in other diſeaſes,* 171, 175
——— *not to be ſuppreſſed, but moderated,* 178, 348

Fevers, *how they end in health,* Page 191
——— *how cured by reſolution,* 193, 211
——— *their prognoſis in general,* 214
——— *their cure in general deſcribed,* 222
——— *their cure by diet or regimen,* 242
———————— *by removing ſtimuli,* 265, 270
———————————— *lentor of the ſolids,* 342
—————————————— *the fluids,* 347
———————————— *from a Plethora,* 338, 340
——— *ſigns of their due moderation,* 352
——— *how to be lowered when exorbitant,* 361
——— *how to be raiſed when too low,* 373
——— *acute, their chief ſymptoms,* 394
——— *their cold-chill at invading,* 404
Fibres, *and veſſels, how weakened by the violence of fevers,* 176
Foods acrid, *how they cauſe fevers.* 71, 303
———— *redundant, how they cauſe fevers,* 77, 312
Frictions, *their efficacy in removing obſtructions of the emunctories,* 335
——— *their uſe in raiſing a fever which is too low,* 379
Fulneſs *of the veſſels, how increaſed by fevers,* 110

G.

Gangrene, *and ſphacelus, how formed by a depoſition of corrupt matter in fevers,* 189
Gangrene, *and ſphacelus cauſing a fever, how they are to be treated,* 273
Gas, *or acrid ſpirit of fermented liquors deſcribed as a cauſe of fevers,* 317
Gun-powder, *exploſions of it; how uſeful to correct peſtilent or contagious air,* 299

H.

H.

Health, *how reſtored in fevers,* Page 192
Heart, *and arteries, their actions deſcribed,* 37, 42
——— *one claſs of its diſeaſes are fevers,* 38
——— *the cauſes of its motion, how they act,* 42
——— *how it may be put in motion after death,* 43
——— *its motion whence increaſed,* 44
——— *how irritated in the beginning of fevers,* 55
——— *its force how to be weakened in fevers,* 365
——————— *to be raiſed in fevers,* 374
Heat, *how produced after the cold-chill,* 56
——— *not the cauſe but effect of fevers,* 59
——— *of weather, requires thin aliments,* 256
——— *ſultry, how the cauſe of fevers,* 94, 281
————— *cauſing fevers how remedied,* 282
Heavineſs *or oppreſſion, how cauſed by fevers,* 146
Humours, *how vitiated by fevers,* 140, 171
———— *how inſpiſſated by fevers,* 142, 177
Hunger, *its nature explained,* 97
Hypochondriacal *anguiſh, nature and cauſe of,* 452, 459
—————— *diſorders, whence they ariſe,* 457

I.

Ichor, *dropſical, how the cauſe of a fever,* 100
Jellies, *in what fevers they afford proper nouriſhment,* 237
Increaſe, *or ſecond ſtage of fevers deſcribed,* 161
Inflammation, *how the cauſe of fevers,* 270
Inflammable Spirits, *their ill effects,* 319

Inſenſibility, *whence it proceeds in the beginning of fevers,* Page 52
——— *in the cold-chill of fevers whence,* 411
Inſenſible *perſpiration of the morbific matter after concoction in fevers,* 211
Intentions, *for the cure of fevers in general,* 222

L.

Laſſitudes, *how cauſed by fevers,* 145
Lentor, *from the fluids in fevers, deſcribed,* 347
Lentor febrile, *in general conſidered,* 148, 227
——— *from fulneſs in fevers how removed,* 338, 340
——— *from conſtriction of the arteries,* 342
Life, *how to be ſupported in fevers,* 229
Lime-water, *how it proves the beſt remedy in a muriatic ſcurvy,* 305
——— *how to be adminiſtered in ſtubborn diſorders,* 306
Liquids, *why the moſt ſuitable nouriſhment in fevers,* 231
Lixivial *medicines dangerous to the brain, if uſed plentifully,* 305
Loathings, *how cauſed in fevers,* 147
Lungs *not ſenſible of pains but anguiſh,* 442

M.

Matter *purulent, how the cauſe of fevers,* 99
——— *how produced by fevers,* 187
Meaſles *ariſe from a critical depoſition of the morbific matter of a fever,* 183, 218

Medicines

Medicines acrid, *how they excite fevers, and cure chronic diſeaſes,* Page 73

Mind, *paſſions of cauſing fevers,* 92

——— —— *how to be relieved,* 300

——— —— *how to be moderated to abate the violence of fevers,* 364

Muriatic *ſcurvy and hectical fevers, how cauſed by ſalt proviſions,* 304

N.

Nervous *anguiſh, how to be treated,* 468

Nitre, *how it cools in fevers from ſultry heats,* 283

———— *it attenuates viſcidities in fevers,* 388

Non-naturals, *deſcribed and conſidered in cauſing fevers,* 275

Nutrition, *how deſtroyed by the violence of fevers,* 172

O.

Obſtructions *of the veſſels, how they cauſe fevers,* 91

Old People, *why they bear faſting beſt,* 252

Opiates, *when of uſe to abate the violence of fevers,* 372

P.

Pain, *how occaſioned in fevers,* 144

Paleneſs, *whence it proceeds in the beginning of fevers,* 48

Palſy, *of the bladders and ſtomach, how produced by an over-diſtention,* 316

Paſſions *of the mind, how they cauſe fevers,* Page 92, 300
——— *how uſeful to raiſe low fevers,* 376
Perſpiration *obſtructed, how the cauſe of fevers,* 83
——— *the moſt deſirable way of expelling the febrile matter,* 194, 211
Peſtilence, *its cauſes not underſtood,* 292
Phlegmons, *how cauſed by a depoſition of febrile matter,* 184
Plethora, *how increaſed by a fever,* 110
——— *how it cauſes a lentor and obſtruction of the veſſels,* 339
Pollutions, *how the cauſe of a* tabes dorſalis, 107
Poiſons, *acrid, how the cauſe of fevers,* 74
Prognoſis *of diſeaſes in general deſcribed,* 221
Pulſe, *its quickneſs, how to be meaſured in fevers,* 14
—— *too quick, the only eſſential and conſtant ſign of fevers,* 29
—— *its condition at the invaſion of fevers,* 46
—— *conſidered as a ſign in critical ſweats,* 201
—— *prediction of criſes thereby,* 139
—— *conſidered as a ſign in critical urines,* 208
Pus, *laudable, how formed of the febrile matter,* 187
Puſtules *in fevers deſcribed,* 180

R.

Red-ſpots, *their nature and ſignification in fevers,* 179
Remote *cauſes of fevers numberleſs,* 64
Reſolution *of fevers, the moſt ſalutary method of curing them,* 193

Reſtleſſneſs *from anguiſh, what it denotes*, Page 464
Rheniſh wine, *how of uſe in fevers from ſultry heats*, 284

S.

Sanguification, *how performed*, 96
Sauces, *acrid, how they cauſe fevers*, 72
Scirrhi, *how formed by a depoſition of the matter of fevers*, 190
Scurvy muriatic, *how cured by lime-water*, 305
Secretion *of concocted matter; how made in fevers*, 117
Serum, *acrid, how the cauſe of fevers*, 100
Shaving *of the head, how of uſe to promote the perſpiration in fevers*, 336
Shakings *in fevers, whence they ariſe*, 420
Shiverings *eſſential to all fevers from internal cauſes*, 13, 15
Sleep, *deficient, how the cauſe of fevers*, 103
—— *and wakefulneſs conſidered in fevers*, 327
Slow fevers, *their nature deſcribed*, 20
Small-pox *ariſe from a critical depoſition of the morbific matter in a fever*, 183, 218
Solids, *how deſtroyed by the violence of fevers*, 170
Sorrowful Paſſions, *how they cauſe fevers*, 88
Spices, *how they correct dampneſs of the air*, 289
—— *their burning acrimony, how corrected by acids*, 308
Spirits vinous, *their ill effects on the body*, 319
Spittings *critical in fevers and ſmall-pox*, 203
Stiffneſs, *whence it ariſes in the beginning of fevers*, 50
—— *in the cold-chill of fevers accounted for*, 411

Stimulating *cauſes of fevers, how to be removed,* Page 265

Stomach, *how obſtructed by taking too much food or drink,* 313

——— *rendered paralytic by over-diſtention,* 315

Study intenſe, *how the cauſe of fevers,* 104

Sulphur, *its burning fumes, how they correct peſtilent contagion,* 298

——— *fumes of it ſuffocate by conſtringing the lungs,* 345

Suppuration, *how the cauſe of fevers,* 102

——— *cauſing fevers, how to be treated,* 271

Sweats, *critical, for the cure of fevers, deſcribed,* 199

——— *not to be diſturbed in fevers,* 202

T.

Tabes dorſalis *deſcribed, from* Hippocrates, 107

Terminations *of fevers deſcribed,* 168

Thirſt, *how produced by fevers,* 144

Trembling, *whence in the beginning of fevers,* 51, 420

Tremors, *febrile, of two kinds, deſcribed,* 421

——— *in general conſidered,* 425

——— *periodical, inſtances of them,* 426

——— *how they hinder the circulation,* 427

——— *ſevere, why a bad ſign in fevers,* 430

——— *why they attend paſſions of the mind,* 431

——— *towards death,* 432

——— *how they ariſe from profuſe evacuations,* 433

——— *how occaſioned by profuſe drinking of any kind of liquors,* 434

——— *how they are beſt cured in fevers,* 436

557

V.

Variolous contagion, *its nature and action deſcribed,* Page 183
Vena portarum *of the abdomen, often the ſeat of anguiſh,* 445
Venery, *exceſſive, how the cauſe of fevers,* 105
Veſuvian volcano, *how it infects the air,* 296
Vinegar, *how uſed to prevent camp fevers from violent heats and exerciſe,* 286
Vomiting *on a full ſtomach, in danger of breaking the gula, by inſtance,* 315
Vomitings, *ſpontaneous and critical, in fevers conſidered,* 204
Viſcidity *in fevers, how cured by diluents,* 386
——— *cured by attenuants,* 387
Viperine Poiſon, *its nature and action,* 266
Vital Powers, *how to be regarded in fevers,* 223
Urines *critical in fevers conſidered,* 207

W.

Wakefulneſs *cauſing fevers, how relieved,* 325
Warm bathings, *their uſe in opening the emunctories obſtructed in fevers,* 334
——— *how of uſe to raiſe a low fever,* 381
Water-drinking, *how of uſe to moderate violent fevers,* 362
Weakneſs, *how cauſed by fevers,* 145, 176
Wearineſs, *whence it ariſes in fevers,* 145

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